Canadian Wildlife Administration

June 1984

84- 4649

Canadian Wildlife Administration

Administering the Resource

Volume X, June, 1984

Manitoba
Natural Resources

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British Columbia's Hunter Number System

In 1982 British Columbia instituted a system of permanent identification numbers for resident hunters. The Hunter Number system was put into place to meet the following requirements:

(a) To provide hunter identification and proof that licence applicants meet licencing requirements.
(b) To reduce the cost of key entry services for all computerized data systems that incorporate hunter identification.
(c) To provide a complete, up-to-date mailing list of all licenced hunters for annual harvest surveys.
(d) To provide a key link between data systems relating to hunter effort and harvest.
(e) To provide enforcement staff with licencing information on individual sportsmen.

In essence the system involves issuing a permanent individual number to identify each resident taking out a hunting licence in British Columbia. It grew out of a search for a less costly and less error-prone method of issuing licences. There are currently about 180,000 resident hunters taking out licences annually. The licences are written up in government offices, sporting goods stores, service stations, and a myriad of other outlets throughout the province. Often the people issuing them are not wholly familiar with regulations, and some seem unconvinced of the need to take care in completing the forms. British Columbia requires hunters to purchase a basic hunting licence each year, plus separate species licences for any of the nine big game animals the hunter might wish to hunt. Since each type of licence must be filled out individually, a considerable amount of time and paperwork can be involved in serving a single hunter. Moreover the licence issuer is obliged to establish the applicant's eligibility to obtain a resident hunting licence before beginning the task. By law, any new hunter taking out his first hunting licence after his fourteenth birthday must show proof of graduation from B.C.'s Conservation and Outdoor Recreation Education (CORE) course or another North American hunter training course. Older hunters whose first B.C. hunting licence predated the hunter training requirement, and youngsters having once got a licence on evidence of their graduation from CORE, could be issued licences by showing a previous licence or by signing a statement attesting that they had held a previous licence.

Licence counterfoils coming into the Fish and Wildlife Branch head offices in Victoria constitute the only central record of licences sold. Under the old system they could be kept in order only by reference to the sequential numbers printed on each. The numbering system provided a clue to where a licence had been issued, but gave no indication of whom it had been issued to. Licence records were of little use for back-checking eligibility of licence buyers, duplications or fraudulent acquisition of licences. To retrace a licence starting from the hunter's name was a monumental and usually impractical task.

The Fish and Wildlife Branch began seriously investigating methods of improving licence issuing procedures in 1974. Several different systems were considered over the years, but implementation of a new system was repeatedly delayed by financial constraints. At one point a five year licence was favoured as a means of providing continuity over a longer period of time, and reducing costs and opportunities for errors to be made. The Branch executive developed a strong interest in a computerized system however, since it seemed to offer more benefits without the loss of revenue foreseen in a five-year licence. They had strong allies in the organized sportsmen and among Conservation Officers, both of whom saw the potential in a computerized system as an enforcement tool.

A central element in all the systems that had been proposed was a permanently assigned number for each licenced resident hunter. Sportsmen and conservation officers thought of it as a means of readily establishing a hunter's eligibility to hold a licence, and as a check to hunters obtaining more species licences than they were entitled to, or fraudulently renewing a licence that had been taken from them for some earlier infraction of the law. Administrators backed the hunter number as a cost-saving device and a means of reducing human error. Computers were already being used to assist in hunter harvest surveys and the like, and the increasing costs of repetitive data entry, in terms of both dollars and of time lost waiting for key entry services, were considerable. So interest in a permanent hunter identification number shifted from emphasis on its probable efficacy as an enforcement tool, to the economies and efficiencies it might offer. A further benefit with potentially even greater usefulness to wildlife managers — the easy retrieval of information from year to year — was also foreseen.

To institute the new system all resident hunters who had purchased a licence during the 1981/82 season were mailed a B.C. Resident Hunter Number Card in April, 1982. Hunters were advised at the same time that they must present this card, or a numbered CORE graduation card, to licence issuers in order to obtain a B.C. resident hunting licence and species licences. Regulations written under authority of the Wildlife Act require inspection of these documents by the licence issuer before a licence may be issued. The sportsman's personal Hunter Number is recorded on all hunting licences sold to him, eliminating the need to write out his address and other identifying features each time, and providing a common link between all the licences he holds each year and in subsequent years.

Qualified resident hunters who had not bought a licence in 1981/82 did not receive a Hunter Number automatically. They could (and can) obtain one through Government Agent or Wildlife Branch offices by producing an earlier licence, or by signing a statement declaring they have previously held a valid B.C. resident hunting licence.

The initial list of Hunter Numbers was set up by drawing information from the 1981/82 licence counterfoils and entering it on a computer file. Names, addresses, birthdates and sex of licence holders, date of issue of the licence and issuing location were recorded. This action facilitated mailing Hunter Numbers to the registered sportsmen and provided the base for developing the master file to be used in subsequent years. Creation of the master file was clerically simple to perform. It is kept current by adding new hunters and recording the hunting and species licences purchased by each individual each year. Changes of address are picked up from licence counterfoils, or through notifications received from hunters. Hunter harvest survey forms include a request for notification of change of address, as do hunting licences. Licence issuers now need only write in an address if it has changed since the hunter received his Hunter Number.

The system meets a number of the objectives of computerized systems earlier proposed in that each hunter is assigned a unique identification number, it provides a complete source of hunter information for hunter sampling, and the Hunter Number provides linkage for integrating hunter effort and harvest data sources.

No drastic change in the form of the existing species and hunter licences was needed to accommodate the permanent number. The scheduled reprinting of resident hunting licences for 1982/83 was simply altered to incorporate space for recording Hunter Numbers. In addition to saving the cost of designing and printing an entirely new style of licence, the fact that licences remained the same in appearance minimized possible confusion on the part of both licence issuers and the public.

The introduction of the permanent Hunter Number has greatly reduced costs and time involved in preparing mailing lists for hunter harvest sample and other surveys. Previously auxiliary assistance equivalent to six man-months was required for the task of selecting samples from the manually filed hunting licence and species licence counterfoils. Selecting the sample from a master computer list has minimized the task.

The system also offers the advantage that other features may be added at a later date. For example, a plastic 'Chargex style' card has been suggested in place of the present paper. Not only would it be more durable, but coupled with an embosser it would simplify the licence issuers' job and eliminate a major source of errors. Maintenance of enforcement listings has been suggested as another extension of the system and could be added if it were found to be necessary or desirable. Other refinements are possible as well, once requirements are detailed by potential users.

Procedures supporting the Hunter Number system are largely clerical in nature, and are mainly located centrally in Victoria. Although cyclical in terms of volumes of work, the system is a year-round operation, with the peak period of activity August through January. As of October, 1983, 209,000 individuals had been issued Hunter Number cards. An estimated 160,000 will be active during the 1983/84 hunting season. Maintenance of the Hunter Number file in Victoria involves about 1,000 name changes and corrections per month, and an equal number of address changes and corrections. In addition missing data such as birthdates must be added, and some Hunter Numbers must be deleted because of licence cancellations, deaths, and hunters leaving the province to live elsewhere.

At present about 1,000 new numbers a month must be added for hunters legally licenced prior to 1981 who did not get onto the original list, and another 500 for hunters newly qualified through the CORE course. The central file is also updated, as already noted, to record current annual hunting and species licences purchased by each hunter. This operation involves about 285,000 entries each year, with 45-50,000 coming through in the peak months. Headquarters also provides licencing information upon request to the Conservation Officer Service for enforcement purposes.

Staffing for the operation in Victoria (exclusive of key entry personnel) consists of one fully assigned auxiliary employee who maintains the Hunter Number file. During the peak period from August to January two additional staff are used to prepare licence counterfoils for data processing to update the master file.

Fish and Wildlife Branch regional offices and Government Agencies are responsible for issuing new or replacement Hunter Number cards to qualified sportsmen. All regional offices receive a regularly updated microfiche listing all sportsmen with Hunter Numbers, for ready reference.

The system has not been entirely free of problems. One never likely to occur again arose because initial implementation of the Hunter Number coincided with a major licence fee increase which doubled most fees. The new licence year begins in April, but in 1982 the licencing system allowed prepurchase of licences prior to April 1st. Traditionally some 2-3,000 licences were issued in March. During the planning and scheduling phase of the Hunter Number system the fee increase had not been indicated, and the printing and distribution schedule for the Hunter Number cards was geared to fit the normal course of licence sales. When the fee increase was announced it was too late to reschedule introduction of the Hunter Number. As a result some 30,000 hunters who took advantage of a one month "bargain" period to purchase their

licences at the old foe had not yet received their Hunter Numbers. Numbers had, of course, been assigned to any of them who had bought a licence the previous year. Considerable clerical effort was required to match the assigned numbers to the counterfoils of their licences, so that the information contained could be processed by the computer system.

A second unforeseen difficulty developed from use of 1981/82 licences as the basis for creating the master file and distributing the Hunter Number cards. Hunter Numbers were assigned in ascending order to an alphabetically sorted list of the sportsmen's last names. In the computerized records an individual was identified by a six digit numeric and the first three alpha characters of his last name. In cases of a common last name, if the issuer made an error in entering the six digit numeric code — for example, if he transposed the last two digits — the error might not be detected through the computer editing procedures, particularly if the wrongly recorded number coincided with that of another individual with the same first three alpha characters in his name. This problem can be overcome in future by adding a check digit based upon some arithmetic manipulation of each identification number.

In the first month of operation licence issuer errors and illegibility of their entries recording Hunter Numbers, address changes etc., were significant, and despite instruction and follow-ups, many errors continue to show up. Some method of inducing licence sellers to follow correct procedures and take proper care in making entries must be found. Perhaps the drastic step of cancelling the issuing privileges of those who will not cooperate will have to be employed. During these first two years of operation clerical manpower requirements have exceeded original estimates largely because of errors and inaccuracies in the issuing of licences.

These problems aside, the Hunter Number system is meeting the requirements listed in the opening paragraph of this article. Moreover, its design will accommodate the introduction of future enhancements to serve wildlife managers even better. For instance, implementation of a plastic embossed "charge card" style of Hunter Number card would not only provide a more durable card for licencees, it would also reduce the time required for issuing licences and eliminate many of the common errors. Hunter Number, name, address and other identifying features would all be printed on the hunter's new licence simultaneously with the roll of an embossing lever — and no error possible on the part of the licence issuer.

The Hunter Number master file, which includes both active and inactive hunters, provides a sampling universe for user preference and socioeconomic surveys on a local, regional, or provincial basis. It will permit cross referencing and comparisons from year to year of the hunting habits and preferences of individual hunters or particular kinds of hunters. For example, it could enable us to determine, not just how many sheep hunters we have, but how constant membership in the sheep hunting group is, whether the same people hunt sheep from year to year, where they live, and so on. Previously we had no way of following an individual's or a particular group's hunting activities from year to year. Among other things, the Hunter Number system could reveal whether in fact (as many sportsmen maintain) the same hunters are receiving limited entry hunt authorizations frequently in spite of the random nature of the limited entry draw. If that proved to be the case regulations could be introduced to ensure wider dispersion of the authorizations.

The Hunter Number will also facilitate cross checking to help establish the validity of data collected from hunters. For instance, are hunters correctly identifying the game they report through mail surveys? Was the white-tailed deer reported really a mule deer? Did ego prompt a respondent to claim to have downed a bull moose, when actually he took a cow, or no moose at all? Were the birds he called 'partridge' actually ruffed grouse? By comparing data collected by staff in the field from individual hunters, with written reports from the same hunters, some measure of the reliability of the self-reported material can be ascertained.

Acceptance of the Hunter Number system by the hunting public has been remarkably easy. As already mentioned, the organized sportsmen had long been advocates of something of the sort. A few individuals grumbled about having to carry yet another piece of paper, but have either accepted it with resignation, or have since discovered its usefulness in readily establishing their eligibility for a hunting licence. A very few saw evidence of Big Brother being manifest, and a handful were suspicious that somehow the new system represented a threat to firearms ownership.

Most hunters, however, seem to have simply accepted the Hunter Number system as a progressive step into the computer age. Admittedly the obvious benefits accrue mainly to the wildlife agency, but thinking sportsmen undoubtedly realize that the collection of improved, more reliable data on hunting will result in better management of our wildlife in time to come.

Paul Haley and Geoff Warden

Canadian Wildlife Service

The International Scientific Conference

— Adventure or Nightmare?

The Canadian Wildlife Service (CWS) hosted the XXVIII International Waterfowl Research Bureau (IWRB) Annual Meeting and Symposium in Edmonton, Alberta during May 1982. The CWS experience in planning and carrying out this symposium will benefit those who may find themselves faced with a similar challenge.

Planning Procedures

When the decision to host a major event has been made, the first and most crucial step is the creation of a Planning Committee. This committee must be small, preferably three people, chaired by a person who is well-organized, decisive and has budget authority. The other two members should complement the chairman's management style. One member of this committee should be an experienced travel planner with knowledge of suitable local facilities, and of conference administration. If the host agency does not have a person on staff who can meet these requirements it may be advisable to consider contracting with a convention planning service or to borrow a qualified person from a cooperative agency. Another committee member should be an expert in the conference subject who will assume responsibility for conference content.

The planning process should begin no less than two years prior to the date of the event and, depending on the number of potential delegates, the scope of the subject and the number of participating countries, possibly up to five years in advance. The date(s) of the event may be chosen by the sponsoring organization (eg. IWRB) or, as in our case, a recommendation by the host agency to the sponsor based on local weather conditions (taking into consideration the field trips envisioned) and availability of meeting and accommodation space. Planning also requires that you note the timing of local holidays which should be avoided.

It is vital to start planning as early as possible because many major hotels and convention centres are booked 2-5 years in advance. The sooner the dates are chosen and reservations made, the better the chances of having the required space, where you want it, when you want it. If planning is left until the last minute (i.e. with only a year or less to go before "D-Day" — sometimes known as the "there's lots of time" syndrome) it may be necessary to take second best or worse yet, get nothing at all.

The Planning Committee should hold a brainstorming session to identify the major conference components, rough out plans for excursions or field trips, estimate the total schedule and, finally, draw up a list of assignments designed to meet these requirements. Each assignment must include a target completion date. Each committee member should be assigned responsibility for one major portion of the total event.

The administrative specialist would take charge of all accommodation, meeting space, conference office, transportation, registration and tour arrangements. This committee member would then delegate portions of these responsibilities as deemed appropriate, maintaining himself as the sole contact person.

The subject expert should handle the symposium agenda, speakers list, session chairmen, call for papers and provision of required audio-visual equipment. He would of course coordinate with the other members and delegate where necessary.

These are only suggestions. The key is to establish an equitable division of labour and for each member to delegate while remaining the sole contact person for his assigned phase of the event.

Facilities

When reviewing the options for locating the event, canvass all facilities that could accommodate the function, asking for written responses from each. The request for information must include answers to these questions: 1) Is the meeting, meal and display space available on the dates required and at what costs?; 2) Are there enough guest rooms for all delegates and at what costs?; 3) Are sample menus for all meals and estimates of cost available?; 4) Can audio-visual requirements be met?; 5) Can translation equipment be accommodated (if simultaneous translation is required)?; 6) What other facilities do they offer (e.g. pool, sauna, exercise room)?; 7) Can they accommodate dietary problems (e.g. diabetes, vegetarian meals)?; 8) What are the

costs for coffee service?; 9) Can they supply power for photocopy equipment or for displays?

When responses are received, do a facilities and cost analysis to determine which are the top two or three bidders. Visit and check out each finalist before choosing one.

Some items the host hotel can be asked to supply at no cost to the planners are: 1) A welcome banner to be hung over the main doorway outside the hotel; 2) A room for use as an office for the duration of the event starting the day before and ending the day after the booked dates); 3) Free parking for the Planning Committee during the event; and 4) A free guest room (usually dependent upon the total number of paid reservations for conference guests).

Ensure only one person is the contact point for the hotel and the convention facility staff.

If, as with the IWRB meeting, there are a number of delegates who cannot get financial support for commercial accommodation (i.e. a hotel) but could attend if other less expensive accommodation was available, consider booking space at a local university campus in addition to the hotel. This will also require arrangements for transportation between the two venues.

One point to remember is that prepayment of the first night's accommodation is usually required by the hotel when a reservation is made. Normally, universities require full advance payment for accommodation. This advance information will have to be provided to delegates with their registration package.

Transportation

Transportation is vital to the success of any event, particularly when more than one venue is used. Again, emphasis should be placed on early planning and "shopping around". Costs vary between companies as does equipment availability. For the IWRB meeting we required 48-passenger buses for tours and excursions (rented from a bus line) but 9-passenger vans were ideal for transporting delegates between venues (rented from a car rental agency). The cost of using a bus for intra-city transport is prohibitive.

Finances

Costs have been mentioned frequently. It is vital that the committee set up a proposed budget as early as possible to determine what it will cost to do all you have proposed. Plan your budget allowing for the maximum cost of all items including accommodation, meals, tours, printing, equipment rentals, contracts, ad infinitum. This will reveal the highest possible payout required. With this information other agencies can be approached with requests to assist in funding the event. An itemized costed agenda can provide 'saleable' items for such external financial assistance.

When a confirmation of financial assistance is received, the balance can be costed on a per delegate basis. This figure will be charged to each delegate as the registration fee. If costs are too high be prepared to cut items from the planned agenda or otherwise reduce expenditures to keep registration fees reasonable. Remember to allow a sufficient inflation factor throughout your planning.

Once the budget is approved don't hesitate to economize whenever legitimately possible while maintaining high standards. Having a reserve fund could be used to cover unforeseen expenditures and unexpected price increases. These can be accommodated through your cost-saving measures.

It will be necessary to open at least one bank account for the conference. The conference registrar will be required to deposit all incoming registration fees plus advance accommodation monies for hotel or university guest rooms. The account should require two signatures on all cheques; however, there should be three people with signing authority to allow for unforeseen absences. Receipts must be issued for all incoming funds and there must be invoices to cover all expenditures. When the conference is over, the person accountable for conference monies should complete a financial statement covering this account and include all appropriate documentation.

Registration

Once all information has been gathered, verified, costed and a registration figure set, it

is time to send out a registration kit and an agenda to all persons, agencies and countries to be invited. Be sure to clear the proposed distribution with the executives of the host organization to prevent duplication or possible political faux pas which could result from misdirected invitations.

As part of the registration package ensure there is a background paper covering points such as weather expectations (for both meeting location and tours or excursions); clothing requirements; monetary exchange rates; visa requirements; available transportation; translation facilities; outlines of available tours or excursions with their attendant costs if any; and information about the city or town where the meeting is being held.

The package should also include separate forms for hotel registration, university registration (if required) and the conference itself. This will provide the registrar with a complete listing of all delegates together with their accommodation requirements. It will also mean that the venues will have an individual hard copy of each person's requirements for accommodation in the event questions arise from delegates upon their arrival. If the hotel requests that registration forms be submitted directly to them with the first night's deposit, that will result in one less bookkeeping chore for the registrar but delegates should be instructed to indicate on their conference registration form that they have sent their registration and deposit to the hotel. This will permit the registrar to have a complete record.

On the conference registration form, it is wise to include an item such as "do you have any special dietary requirements, if so explain" with sufficient space for a response. Asking questions or using simple statements with boxes for a "yes" or "no" response is the most accurate way to obtain the required information.

In each instance include specific directions for distribution of completed forms and indicate if monies should be included, how much and in what currency.

Be sure to set a date for return on each form of at least eight weeks in advance of the event, remembering time is required to do the documentation for the convention and that venues require plenty of advance notice for occupancy numbers, meals and meeting room arrangements.

Tours and Excursions

When making plans for tours or excursions in conjunction with a conference, take into consideration the preferences of the delegates. Canvass the people in your agency for ideas on places to stop that are relative to the theme of each field trip. Everyone will have their favourite spot. The judgement of the Planning Committee will prevail in order to make the trip both manageable and enjoyable. Bear in mind the interests of the delegates and seek a balance between quality and quantity of experience as well as between long, tedious travel and an overly rushed schedule. The 3-5 day tour was found to be the most acceptable for the pre- or post-conference trip associated with the IWRB conference.

It may be profitable to refresh the mind and body by scheduling a mid-week break in a conference for a one day or half-day excursion. The IWRB meeting broke in mid-week for a trip to the field and an afternoon of bird watching followed by a bar-b-cue and an after dinner walk. The opportunity to stretch legs and enjoy fresh air invigorated and revitalized delegates.

The arrangements for tours include hotels, transportation, meals and breaks. To offset expenses approach agencies to host various meals on these tours. Don't limit the group to restaurant food only — consider a weiner roast, an ethnic meal, or a picnic lunch (bag lunches can be purchased from hotels or universities). Also consider staying at various universities and colleges rather than hotels, again to reduce costs. Mid-morning and mid-afternoon breaks do not have to include coffee. To avoid having to make stops in towns or at roadside restaurants, serve delegates individually packaged fruit juices, granola bars or fresh fruit thereby varying the breaks each day. These can all be served on the bus after a planned stop and the debris collected in large plastic bags for later disposal.

Meals

A rule of thumb is to serve delegates some of the local specialties but remembering that some of the common foods with religious or allergic restrictions are pork, fish and eggs. If these are served, be sure that there are alternatives. Serving a buffet lunch allows delegates the option of how much to eat and thus eliminates a tendency toward drowsiness after a full course meal at mid-day. Light lunches and substantial dinners should be the rule. It is also wise to leave a couple of evenings free allowing delegates to experiment with the local cuisine and entertainment.

Media

Ensure that a pre-conference media kit includes the names of 1 or 2 spokesmen for the conference. It is better to have one well-informed spokesman than several different stories from several different people. Also, advise the media if there are portions of the conference not open to reporters (e.g. the business meeting). Be sure to include a complete list of symposium speakers and topics with the times of presentation so reporters may choose topics which are pertinent to their audiences.

Appreciation

When all is over be sure to write to every individual who assisted in any way with the event. Thanking them for their individual effort may make them more willing to help in future projects. A form letter will not suffice here.

Summary

With adequate planning and cooperation from the staff of the host agency, a conference is an adventure. It provides the opportunity to make new friends, renew old acquaintances, learn new concepts, share experiences on both a work-related and a personal basis, and it allows you to present your agency and city or town to the many visiting delegates. The success resulting from a well-planned event is exhilarating for all involved and a boon to the agency hosting the function.

Inadequate planning, lack of forethought and working with the erroneous belief that "there's lots of time" results in a nightmare not only for planners but for the delegates as well. The impression your agency makes on delegates will not be auspicious to be sure.

Plan ahead, plan thoroughly, have one contact person for contributing agencies and facilities staff, and success will result.

Penelope West

Canadian Wildlife Service

Who Does What?
— A Question of Values

In late April 1982, Gaston Moisan, Jim Foley and I sent the Director General of the Canadian Wildlife Service a report entitled *Roles and Responsibilities of the Canadian Wildlife Service — A proposal.* This paper contained suggestions that are likely to result in profound changes both in the Canadian Wildlife Service and in all wildlife and environmental conservation activities in Canada. It is still too early to predict exactly what reception this paper will receive, but it is already evident that no one can remain indifferent to it; more people have taken exception to it than agreed with it.

Why undertake this kind of exercise? What could this proposal contain that would create such a stir?

The lack of a clear specific corporate mandate created increasing uneasiness and confusion within the Canadian Wildlife Service; the recent budget restraints certainly did not alleviate the situation. The need to make fair and rational cuts in the Canadian Wildlife Service's programs made the need to define its role and responsibilities all the more urgent. Moreover, is it not normal to have a clear idea of one's responsibilities at all times? Therefore, our work was not a superfluous exercise.

We could have approached this in two ways. The first would have consisted of deducing and determining the roles and responsibilities of the Canadian Wildlife Service by reviewing the acts, conventions and regulations that come under its jurisdiction. The second was more risky and lengthy, but much more promising; it consisted of disregarding existing legislation and studying the responsibilities that are normally assigned to a government agency responsible for managing nature on a national scale, of deriving from an ideal model practical proposals and solutions that are applicable in a Canadian context.

We chose the more promising path!

Based on certain conservation concepts and activities, we made the following observations, which enabled us to redefine the Canadian Wildlife Service's mandate more appropriately:

1. The English term "wildlife" is generally taken in its narrowest sense to mean wild fauna and game, and is not given its literal meaning of "wild life". Consequently, a large number of organizations devoted to the protection of nature overlook several groups of animals and plants.
2. Flora and fauna are representative of different values that can be categorized as: cultural, ecosystematic and economic. We noted that the economic values have often been emphasized, whereas, the other two categories have been ignored or neglected.
3. With regard to values, there are several levels of interest that should coexist; levels that are not mutually exclusive. There is the level of individual and of special groups interest; there is local, regional, national and international interest. We consider it important that each of these levels be served in an equitable manner. Could the orientation of associated agencies not be related to these various levels of interest?
4. In Canada, responsibilities are divided by groups of animals — migratory birds are the responsibility of the Canadian Wildlife Service, marine plants, mammals and fish are the responsibility of the Department of Fisheries and Oceans, and certain other plants are the responsibility of the Department of Agriculture. Although it is not set out in the Canadian Constitution, most species that do not fit into these categories have been considered the exclusive responsibility of the provinces. Up to a certain point in time, these species were of strictly local or private interest, but today, national and international interest in nature and its components is growing.

We based our proposal on these observations.

Therefore, we recommend that the Canadian Wildlife Service's area of activity include both flora and fauna and that it be expanded to include all plants and animals in Canada. Nevertheless, we are not recommending the creation of just one federal agency to look after all nature conservation activities; instead, the

Canadian Wildlife Service should combine its efforts with the efforts of other federal agencies working in related areas, while sharing responsibilities according to levels, jurisdiction and special interests. What is important is that all participants be aware of their own responsibilities and that their activities be well coordinated.

We propose that the CWS set for itself the objective of contributing to the welfare and knowledge of Canadians and the harmony of the biosphere through conservation of wild plants and animals and their development on a continuous and lasting basis. Wherever possible, conservation should be based on benefits to the public.

Two broad responsibilities naturally result from this objective — one involving conservation and the other development or provision of benefits.

With regard to conservation, we propose that the CWS work with the other participants to define and promote a sound and appropriate succession and development of wildlife species across Canada and in the world. With regard to its development responsibility, we invite the CWS to develop these species, to increase appreciation of them and to manage them for the benefit of Canadians and the rest of the world.

We think that the approach we propose is flexible, that it should result in more comprehensive and more effective conservation and that it should promote greater public participation. Before we can determine what part of our proposal will be accepted, a lot of progress must be made. However, we are confident that in the not too distant future, it will lead to beneficial changes.

Pierre Desmeules

The Use of Computers In the Canadian Wildlife Service

1.0 Introduction:

The computer, viewed by many as a black box, plays an important role for researchers, managers and administrative support staff in wildlife management.

The computer's ability to handle problems, however complex, has helped speed decision making. A misconception about the computer is that it is primarily used to perform monumental mathematical calculations impossible for humans to do. Use of computers has broadened today compared to thirty years ago when they were the exclusive domain of mathematicians and astronomers. Computers were operated exclusively by specialists for whom the problem of human interface was relatively unimportant and frustrations were borne by experts trained to overcome such challenges.

But all that has changed. No longer the exclusive tool of specialists, computers have become both commonplace and indispensable. Everywhere we turn, they are at work mainly because of their speed, communication and storage capabilities. A computer is a productivity machine that enables managers to make quick and effective decisions.

The main objective of this paper is to focus on the current and future use of computers in wildlife management, and some of the key problems that first-time users can run into.

2.0 Current Use of Computers by the Canadian Wildlife Service

The Canadian Wildlife Service is currently using computer technology for applications in financial planning and administration, species population management and research. This section will focus on these applications.

2.1 Financial Planning and Administration

Wildlife organizations are often dispersed among headquarters, regional and district offices. This creates the need for consistent financial systems. Such systems can now be based on local computer processing. Instead of keeping all records in a centralized data base, the various offices can use microcomputers with local data storage capacity plus the added ability to communicate with a central system and with other terminals.

The AFMAS* Accounting System, used by Environment Canada including CWS, is one such configuration. This system, which was developed two years ago, allows a local user to access up-to-date information on accounts receivable and payable, and to transfer information to other offices across the country in a matter of minutes instead of days. Accounting, budget and other reports are produced regularly to assist managers in planning and daily operations.

Following the success of other packaged software, financial packages are becoming very popular with administrators. Environment Canada has introduced a package called IFPS** whose use is increasing among managers. It is designed for use by those with no prior computer programming background. This modelling system is used to prepare budgets and to conduct feasibility studies.

Word processing, also involves the use of computers which are usually dedicated to this task. Word processing describes the creating, displaying, editing and printing of textual information, with the capability of tabulating, justifying and formatting. A word processing system is configured using a mini or microcomputer with a CRT (Cathode Ray Tube) display, diskette storage and letter quality printer.

The ability to edit and manipulate lines and paragraphs is made possible by the use of a CRT device with appropriate software support.

The ability to modify, move blocks and search texts without retyping the entire document is an extremely helpful feature of the word processing system. This facility has improved productivity and the quality of work.

Connecting word processors into a network is discussed later.

2.2 Population Management

The CWS Migratory Game Bird Hunting Permit File system is a major data base on migratory game bird hunters (some 500,000 permits) from which random samples are selected to conduct the National Harvest

* AFMAS — Automated Financial Management System.

** IFPS — Interactive Financial Planning System.

* "The Investment of Wildlife to Canadians" by F.F. Pitlen. Canadian Wildlife Service, Ottawa, 1980

Survey (NHS) and the Species Composition Survey (SCS). The surveys and other data provide CWS with the information needed to estimate the annual kill of migratory game birds which in turn aids it in setting annual hunting regulations such as the season and bag limits.

At present large (mainframe) computers are used to keep permit and survey data. Results of annual surveys are compiled and published each year including: permit sales by province, estimates of total kill, kill/hunter for the species groups on the NHS questionnaire, kill estimates by species, estimates of age, sex ratios by species and other statistics.

Records are kept of past permit sales and survey data so that files can be retrieved for use in other projects.

The Enforcement Section of CWS uses the computer to check previously convicted hunters (those whose licences have been suspended) against the current year permit file. The permit file also aids the Enforcement Section in such areas as lost permit enquiries by hunters.

The current state of technology makes it possible to exchange, share and transfer data very quickly via computer. The present methods used to achieve this are tapes, microfiche, floppy disks and communication networks such as Datapac (Bell Canada) and Infotex (CNCP) using telephone lines. The latter method is the most expensive but most effective where immediate access to decision-making data is needed.

The Canadian and U.S. wildlife services exchange and share data as part of several computer-related projects. Currently, this is done primarily through the use of magnetic tapes and microfiche. One of these projects where computer data is regularly exchanged between the two countries is the North American bird banding and band recovery files.

In North America, over one million birds are banded each year. Computers are necessary to maintain and update such a large data file. It enables banders to submit their banding schedules on computer tape. Several computers are used in the banding program. General purpose data base maintenance packages are used for storage of diverse information such as band inventories and colour marking projects.

Another joint project involving computers is the Breeding Bird Survey. Data collected in both countries is stored on computer files and regularly exchanged for research projects. The tasks of editing and verifying data in Canada and the U.S. has benefitted from the use of parallel input components in the two countries.

2.3 Research and Analysis

The ability of a computer to perform complex calculations, handle large amounts of data and perform repetitive and iterative tasks has made it a vital tool in research and analysis.

Data collected from every study or survey is expected to produce some results. Based on the results, further studies are conducted to increase the knowledge base in the subject or to implement results.

Results are produced by one of several computer packages available depending on the nature of the task. For example, complex

calculations are often required in data analysis. There are three types of application packages designed to aid the analyses.

a) Statistical Packages (SAS, SPSS, BMDP).

These specialized packages are available on most large-scale computers and will be available on microcomputers in the near future. The packages allow the use of techniques such as multiple regression that require complex computations that are not practical to do by hand. These packages are designed and developed mainly for statistical analysis but their use goes further to include analysis of variance and Chi-square.

b) Biological Packages (POPAN, PDE, BROWNIE, ESTIMATE).

Often packages are developed in order to handle special analyses. Some of the packages used by CWS are:

- POPAN, a data maintenance and analysis program used for recapture applications;
- PDE, a package used to calculate density estimates;
- BROWNIE AND ESTIMATE, programs to analyze bird banding data.

These packages are written in Fortran and are designed to run on most large-scale computers with slight modifications.

c) Information Retrieval Packages (EASY TRIEVE, MARK IV, INFO).

Requests are often received from universities, other wildlife agencies and individuals requiring specific information from large data bases such as those for the Breeding Bird Survey, or bird banding file. These packages aid the user in quickly extracting information from such data bases. The use is very simple and does not require much programming knowledge.

The analysis of large bodies of data is the principal use of computers made by social scientists. The data processing power of the computer has considerably enriched social analysis. An example of this use is the recent survey conducted on "The Importance of Wildlife to Canadians"*. The data collected from this survey which involved approximately 1 million pieces of information from 76,000 six-page questionnaires was tabulated by Statistics Canada using its computers. Without this tabulation, the analysis and publication of results would have taken several years rather than several months.

One of the major and important attributes of a computer is its ability to perform iterative and repetitive calculations. Where large data sets require numerous iterative calculations computers are indispensable. Calculations of variances associated with a mean requires many intermediate iterative calculations such as sums of squares. The computer will repeat this task as many times as required. Anyone who has calculated sums of squares on a hand calculator will recognize the benefits of such capabilities.

2.4 Computer Mapping

The computer-generated map is a visual instrument that allows users to extend their normal range of vision to see the spatial arrangements that exist over large areas. The map allows us to record, calculate, display, analyze and understand the spatial interrelationship of events.

Two methods in current use are: drawing particular data on base maps and plotting data onto clear overlays. Computer mapping is used by the CWS to plot banding locations, the kill of game bird species and to plot migration patterns determined by banded bird movement. Maps such as these are very time-consuming to produce by hand.

3.0 Future Use of Computers

We can only speculate on the scale of computer use in the future. Many organizations today are looking forward to making the best use of the available technology to solve the problems of tomorrow. Wildlife agencies are no exception.

Some of the areas that the Canadian Wildlife Service is heading towards in the future are:

3.1 Office of the Future

What is the future office? It seems to be made up of at least two basic components, word processing and electronic mail making use of computers and teleprocessing. In fact, an

office of the future system bears a striking resemblance to a computer network. So it would seem that much of the technology that is presently used in networking can also be applied to the 'office of the future.'

One of the components of the future office, word processing, is in current use in most of the offices of the CWS but connecting them into a network is still to come. Manufacturers of word processing systems along with companies such as CNCP and Bell Canada are working towards a standard protocol that will allow any word processing system to communicate with another. At present, communicating between different word processing systems is cumbersome with problems in text formatting because of incompatible codes and protocols.

The other component of the office of the future, electronic mail, is an application that parallels networking. The underlying objective of electronic mail is the reduction of memoranda and other paper movement. Electronic mail applications consist of creating interoffice memoranda and messages on CRT terminals and transmitting them electronically to recipients. Each individual in the system has an electronic "mail box." These individuals can periodically examine the contents of their mail boxes to read current correspondence. Other facets of electronic mail are electronic telephone messages and an executive calendar to record meetings and appointments.

The office of the future or "paperless" office will probably be a reality in the next ten years.

3.2 Image Processing

A variety of techniques exist for processing pictorial information such as aerial or satellite photos, by computer. These techniques are collectively referred to as image or picture processing. The information to be processed is usually input to the computer by analog-to-digital conversion of video signals obtained through a two-dimensional scanning device (television camera, facsimile scanners).

Currently in use in some areas of wildlife research, this application will be used more extensively in future to allow researchers and biologists to make more accurate and precise population estimates. For example, this technique could allow waterfowl biologists to identify probable areas of catastrophic or outstanding goose production, thereby enabling them to predict and improve population production.

3.3 Computer Graphics

Computer graphics may be defined as the input, construction, storage, retrieval, manipulation, alteration and analysis of objects and their pictorial representation. Computer graphics in general includes both off-line input of drawings or photographs via scanners, digitizers or pattern recognition devices, and output of drawings on paper or microfilm via plotters and film recorders.

Computer graphics is used today in industry, business, government, education, entertainment and, most recently, the home. The list of applications is growing very rapidly. For example, television news makes use of computer-generated graphics to enhance its visuals. Graphics today are most frequently used to draw two- or three-dimensional representations of mathematical, physical and economic functions, histograms, bar and pie charts, task-scheduling charts, and inventory and production charts. All are used to present trends and patterns in a meaningful and concise fashion in order to increase understanding of complex phenomena and to facilitate informed decision-making. Computer graphics is considered a special form of communication requiring special input/output hardware and software. Many computer graphics applications seem somewhat exotic to most people and many do require expensive hardware (both processing power and storage capacity) and high quality output devices.

Fortunately, the rapidly decreasing cost of hardware (especially memory and microprocessors) is making computer graphics practical for a large number of applications requiring only modest processor and display capacities.

3.4 Planning

At present, planning systems are used to a limited extent but they will assume even more importance as improved systems are developed in this area to solve higher level, unstructured problems.

Planners are increasingly able to deal directly with a computer-based system rather than through an intermediary. This is happening because:

a) the capability for writing sophisticated models and manipulating them in natural languages gives users the ability to model their own problems rather than being tied to a ready-made model whose structure does not represent their environment;

b) the availability of interactive, small, dedicated computer systems which permit users to interact directly with the planning system at their own pace, without constraints imposed from the outside.

The plan is immediately usable with no additional manipulation. The availability of real-time data directly accessible by the computer system means that plans can be monitored by the system and users quickly alerted to problems.

3.5 Simulations

Simulation is the representation of certain features of the behaviour of a physical or abstract system by the behaviour of another system. In computing, simulation refers to the employment of the computation process to implement a model of some dynamic system or phenomenon. The purpose of simulation is usually to make experimental measurements or predict behaviour.

For example, weather forecasting, which is very important to wildlife research and management, is based on simulation. The equations governing changes in temperature and pressure over time for even a small region of the earth's surface, require large amounts of computer time. With present speeds and memory capacities, it is difficult to forecast weather patterns for a period of more than a few hours, but as machines and simulations improve, longer-range, more reliable forecasts will be possible.

3.6 Import-Export Permit Control

One proposed future use of computers is the control and summary of information on holders of permits issued under the Convention on International Trade in Endangered Species (CITES). These permits are issued both by CWS and by provincial and territorial governments. At present, all work is performed manually including:

a) issuance of import-export permits and file-keeping;

b) lists of endangered species, importers and exporters;

c) communicating with Customs and Excise at ports of entry;

d) communicating with the public regarding import-export regulations and other enquiries;

An inexpensive microcomputer could be used to maintain all records of this CITES activity thus freeing limited resources.

4.0 When and Which Computer?

These are two difficult questions to answer. Computers always bring their own overhead costs in downtime, training, programming and even game-playing that may override the benefits they provide. The decision to automate depends on the amount of data to be processed, the repetitiveness of calculation, the timeframe for projects and the accuracy desired.

When small computers were not so common, the use of large computers in centralized computer departments or private service bureaus was the only choice for most computing needs. Today, because of miniaturization and dropping prices, microcomputers have completely changed the field of computing. Small organizations are constantly discovering new ways to make use of this new technology. However, the answers to the two questions can best be found through a complete feasibility study.

4.1 Standardization of Hardware and Software

It is very important to ensure compatible equipment is installed where more than one location is concerned. Because of long distances in some cases, a Centralized System at one geographic location may not be appropriate; however, a Distributed Computer System could be the answer.

Distributed Computing is defined as the functional distribution and co-operative processing of applications among multiple computing nodes interconnected by a communications network for information transfer. This type of a system satisfies a number of objectives including:

- faster and easier access to data for decision-making;
- improved reliability, security and integrity;
- improved modularity;
- improved control and reporting in a geographically dispersed organization;
- lower total organization cost;
- faster response to change of requirements or priorities;
- lower communication cost;
- lower cost than upgrading a Central System; and
- local financial approval.

Increasing pressure to improve organizational efficiency in a very changeable and dynamic environment appears to be providing the impetus for geographically-decentralized organizations to move towards distributed computing systems. In contrast to increases in processing power which have been a principal motivation to move to more advanced systems in the past, the main objective in the application of Distributed Computer Systems techniques is to provide increased data availability to the end user and reduced exposure to total system failure due to malfunctions in hardware or software. The increased data availability improves efficiency and thus reduces total organization cost while increasing the level of productivity for the same cost.

4.3 Biometric and Computing Support

Although everyone is becoming more computer literate, the smooth operation of new computer systems is very technical and requires the expertise of statisticians and systems analysts. Staff expertise and training should be considered in any decision to acquire computers.

4.4 Availability of Quality Software

Good and reliable software will always produce good results, but unfortunately a great deal of software available for the microcomputers today is not the best. Software should be evaluated as carefully as the computer itself.

5.0 Problems Related to Computers and Recommendations to Overcome Them

There are several problems which can offset the substantial benefits of a computer. Some of the major ones are:

5.1 Fear and Hesitancy

This is a very common problem in any organization using computers. Since the use of computers requires technical training, the fear and hesitancy of some personnel will remain until such training is provided either in-house or by specialized agencies.

The growing use of microcomputers is solving this problem to some extent through the design of products, both hardware and software, that are very "user friendly."

5.2 Keeping Up With the "State of the Art" and the Problem of Obsolescence

Because of the computer boom, it is very difficult to keep up with the proliferation of new products. For the next five to ten years, the level of microelectronics development should continue to produce improvements at the current rate. For those who want to upgrade existing installations or expand it is always difficult to estimate accurately when hardware or software will be obsolete.

5.3 Errors

The problem of errors is an important one to computer users. When a computer produces an incorrect result, the error may come from one or more sources. They can be grouped under four headings:

1) hardware errors, which result from a malfunction of some physical component of the computer;

2) software errors, which result from coding errors in some program, but not necessarily in the program that seemed to produce the wrong results;

3) algorithm errors, which result when the method used to solve a problem is faulty;

4) data entry errors, probably the most common of all, occur when the operator of a data entry terminal (e.g., a terminal for direct entry into the computer, a key-to-disk terminal or a card punch) makes an input error, usually by pressing the wrong key.

5.4 Cost Consideration

The first question that usually comes to the mind of many managers and administrators is cost. It is one that should be evaluated in light of the various costs and benefits that can be quantified. A cost-benefit analysis along with the advice of present users of the hardware and software in question will be valuable in such evaluations.

6.0 Conclusion

The computer referred to at the beginning of this paper as 'the black box' is really not a mysterious machine but rather a series of components with specific functions each of which is usually quite straightforward. The advantages of using computers to process and store information are growing constantly.

Computers are now capable of controlling such technologies and applications as:

- MIS (management information systems)
- video graphics
- word and data processing
- computer-assisted instruction
- electronic mail
- data bases management
- communication networks
- optical character recognition
- artificial voice
- electronic funds transfer
- data entry
- computer programming itself

The list goes on. Computers are into everything. It is wise to start with a strong foundation and build upon it gradually rather than to rush blindly into the field.

The Canadian Wildlife Service is gradually building up its computer system allowing time for everyone concerned to become familiar and trained so that efficient and effective management decisions can continue to be made.

Acknowledgements:

I would like to thank Steve Wendt, Fern Fillion, Jean Cinq-Mars, Brian Collins, and Wayne Roddick, who have contributed to and reviewed this paper.

Balgit Nagpal

Manitoba

Five Year Report to the Legislature on Wildlife

— The First Edition, March 1983

Introduction

Manitoba has struck a new initiative in government accountability for management and conservation of provincial wildlife resources. That initiative came in the form of a Five Year Report to the Legislature on Wildlife.

On August 29, 1980, a new Wildlife Act was proclaimed for Manitoba. Part V of Chapter W140 of the Statutes of Manitoba 1980, c.73, requires the Minister responsible for wildlife to provide annual and five year reports to the Legislature, containing:

"(a) a review of the status in the province of the animals listed in Schedule A and of such other wildlife as the Minister may select for review;

(b) a review of the wildlife management programs implemented by the Minister and an assessment of their effectiveness;

(c) an analysis of trends in, and a forecast of demands for, the use of the wildlife resource in the province; and

(d) an evaluation of the capability of the wildlife resource in the province to meet anticipated demands."

The first five year report required by this legislation (for the period ending March 31, 1982) was tabled in the Manitoba Legislature in April, 1983, by the Honourable Al Mackling, Minister of Natural Resources. Preparation of this report was perhaps the most challenging and formidable task the Manitoba Wildlife Branch staff as a whole has faced in contemporary times. Albeit, the report is not without its shortcomings, it is still easily the most comprehensive single document available on the broad spectrum of Manitoba's wildlife resources.

It is probably fair to say that the magnitude of the task of preparing a report that would satisfy the rather specific requirements of this piece of the legislation escaped all but a few of the staff. The first of several drafts was assembled by a person assigned to coordinate input from various sections and wildlife specialists in the Branch. This being the first such report, a historical perspective was required for much of the material on species status, trends in use and management activities.

It soon became clear that to meet the deadline of March 31, 1983, an all out task force effort would be required to incorporate that historical perspective, to assemble information and graphics, to draft the text, to reduce technical jargon, to edit each section and to mold the sections into a readable document. The preparation of the report became a Branch priority, and for nearly six weeks, selected staff from field management, research and administrative levels in the Branch were seconded to work virtually full time on the report.

The Report

The report is 150 pages in length, printed back to back with five major parts. The contents of each section is outlined below:

Executive Summary

This eight page section is designed for "quick study" by legislators and other individuals who may not have the time or the inclination to read the complete report. Highlights of the trends in the status and use of wildlife, management programs and management imperatives are presented in terse, point form. This section contains little in the way of verification or rationale.

Introduction

This is a one page section describing the requirements of the legislation that the report was designed to fulfill.

Overview

The reader is presented with the significance of Manitoba's wildlife resource in terms of geographic distribution, economic importance and numbers of people involved. This section comprises two and one half pages.

Status of Wildlife

The current status of wildlife species in terms of current populations and projected trends in those populations is dealt with in this 53 page section. Trends in use and forecast of demand for each species or groups of species is also covered in this section. Arriving at a consensus on the status of various wildlife

species, perhaps more than any other part of the report, caused the most soul searching and debate among wildlife managers, both at the field and head office level. Time after time, data sources had to be rechecked to resolve discrepancies. In the end, the authors of species accounts had to satisfy the challenges of peers before the statements were entered into the final draft. There have been few exercises that better illustrate the "state of the art" knowledge of wildlife populations in Manitoba. If managers were unclear as to their priorities for wildlife population data requirements heretofore, this exercise quickly crystallized their objectives for future work.

Wildlife Management Programs
A review of the wildlife management programs implemented by the Department and an assessment of their effectiveness comprises this 79 page section. This material reveals the diversity and complexity of programs delivered by the Wildlife Branch and its cooperating agencies. It is not surprising that the analysis of each program's effectiveness was the most difficult aspect for authors preparing this section. It served, however, to demonstrate to program managers the importance of annual evaluations of projects in terms of cost-effectiveness and goal achievement.

Conclusion
Four pages of conclusions were drawn from the foregoing text. Positive and negative trends in wildlife stocks and use are summarized and some prognostications are offered as to the consequences of those trends. In this part of the report, the authors attempt to place before the public in succinct terms the problems and potentials that wildlife in Manitoba will present over the next half decade.

Implications

The requirement for such an accounting on the status of the wildlife resource may not be unprecedented in the United States. It is also recognized that the province of British Columbia had a similar legislative requirement in place for some time but to our knowledge that requirement no longer exists.

Given the fact that this was the first report of its kind to be prepared by a Canadian wildlife agency, perhaps it is excusable that such things as graphics and layout are less than impressive. The report also suffers from the task force approach in that several writing styles are meshed together in the text. Despite the scrutiny of the editors, value judgments, technical jargon and over-emphasis crept into the report.

All of that notwithstanding, the Five Year Report to the Legislature on Wildlife in Manitoba represents a new level and intensity of accountability for stewardship of a public provincial resource. This exercise can be likened to a "State of the Union message" on wildlife. It presupposes that wildlife managers and administrators will be cross-examined and held accountable for their statements by elected representatives, by their peers, by special interest groups, by the media and by the public at large. The report begins a record against which future wildlife management programs will be measured for progress or a lack thereof, at five year intervals. The requirements that this legislation places on wildlife managers underscores the need for application of sound scientific methods and principles in wildlife management and adherence to the highest professional standards in execution of wildlife staff duties. "Rules of thumb" and ad hoc management are clearly liabilities in this process.

The overriding value of this account of wildlife stocks and programs to manage those stocks is expressed in the concluding paragraph of the report:

"Wildlife management over the next five years, perhaps more so than any time previous, will require the support of a well informed public. Despite their value to society, wildlife resources are often taken for granted and concerns are raised about their status only after their continued existence is seriously jeopardized or beyond reasonable hope. The very abundance and variety of wildlife to which Manitobans have become accustomed has lulled us into a false sense of security respecting its continued existence. For a variety of reasons, those who use and cherish wildlife the most have not been particularly adamant in its defence. If wildlife is to survive this must change. An awakened public awareness is the best (and perhaps only) security wildlife resources have. No significant protective effort can be sustained without public backing. Attempts to rebuild a devastated resource will be expensive and largely unsuccessful. It is preferable to adopt a strategy which will avoid such unnecessary costs. The alternatives of not doing so are quite clear."

Herb Goulden

Manitoba

Cooperative Wildlife Management in the North

— Manitoba's Wildlife Advisory and Planning Board of the Northern Flood Agreement Areas

Energy, environment and man, especially the interests of man, have presented society with the most pressing and difficult issues of recent decades. Today's civilization as represented by conventional North American society is energy dependent to the point where its very fabric cannot withstand even short-time shortages. Dependency is exacorbated by high cost, negative environmental impacts and particularly the effects of energy development on locally affected residents. Diversion of the Churchill River and manipulation of Lake Winnipeg's water levels for hydro-electric developments in northern Manitoba are no exception.

Developments of this nature often carry a mixed bag of blessing and hardship. They provide energy to the south and much needed jobs and improved transportation to the north, but all too often the major impact on northern residents is change, resulting in disruption and stress and the need for mitigation.

Fortunately for northern residents, these developments have occurred in an age of relative enlightenment which is providing mitigation to affected communities.

The recognition that impacts of development may extend far beyond the shoreline of a flooded lake or dried-up riverbed and that loss of traditional modes and routes of transportation may disrupt ways of life and livelihoods, were two significant precursors to negotiations which resulted in an agreement to provide mitigation to five northern Manitoba Indian Bands. In 1977, the Indian Bands (represented by the Northern Flood Committee), Manitoba Hydro, the Government of Canada and the Government of Manitoba, entered into the 'Northern Flood Agreement'. The agreement provides for the social and economic restitution of the affected communities.

Foremost among the provisions of the agreement is an Article recognizing the significance

of hunting and fishing to Indian people. The Article provides for resource allocation, reparations for loss of income and income-in-kind, control of harvest, consultation and training towards employment. Its major provision, however, is the establishment of a Wildlife Advisory and Planning Board. This board is particularly salient, as its primary focus is the recognition of Indians' vocation and avocation of hunting, fishing and trapping. Its significance goes beyond mitigation because of its potential to foster Indian involvement in contemporary wildlife management.

Manitoba's Department of Northern Affairs facilitates the administration of the board while the Department of Natural Resources provides professional advice on matters pertaining to Crown land, fisheries and wildlife and the administration of the respective Acts of the Legislature.

As a result of concern for moose populations, a major moose program began in 1982. The board recommended intensive surveys to aid in the formulation of allocation and use decisions. Automated remote sensing techniques, resulted in high accuracy habitat maps (1:250,000) representing seven major vegetation community types. Aerial surveys of moose have been conducted in statistically selected areas. The habitat maps are the basis of the selections. It was recognized at the outset that random sampling in such a vast area (152,000 square kilometers) by conventional aerial observation would result in statistically useless results unless a program, costing in excess of $1.0M was launched. The revised program involving remote sensing will instead cost approximately $250,000.

People from the Indian Reserves participate in the surveys and hunters, trappers and fishermen have shown that they can easily use the multi-colored computer-produced habitat maps. The survey has also served to generate employment in this economically depressed area of Manitoba. Following the survey and in consultation with the Board, wildlife specialists will develop a moose management plan for the area. Similar work is planned for waterfowl.

In 1983, the Department of Natural Resources instituted a 'Resource Management Assistant (RMA) Program,' for the Province through which people from remote communities can upgrade their skills to become the 'lead hand' in resource management issues in their communities. The RMA receives on-the-job training in several resource management fields and the program covers different aspects of resource management at different times of the year. Individuals can choose particular endeavors and obtain certification in that specialty.

There are now two RMA's in the area covered by the Northern Flood Agreement, one in each of the communities of Cross Lake and Norway House. Their duties include assisting in fish and wildlife management, maintaining government facilities, arranging meetings, controlling problem wildlife, etc.

Recognizing the importance of the availability of professionally trained guides for future tourist developments, the Board requested a special guide training course for the communities. The course spanned ten days, during which time prospective guides were intensively instructed in first aid, hunter safety, wilderness survival, map and compass reading, meal planning and preparation and fish and wildlife management principles and techniques.

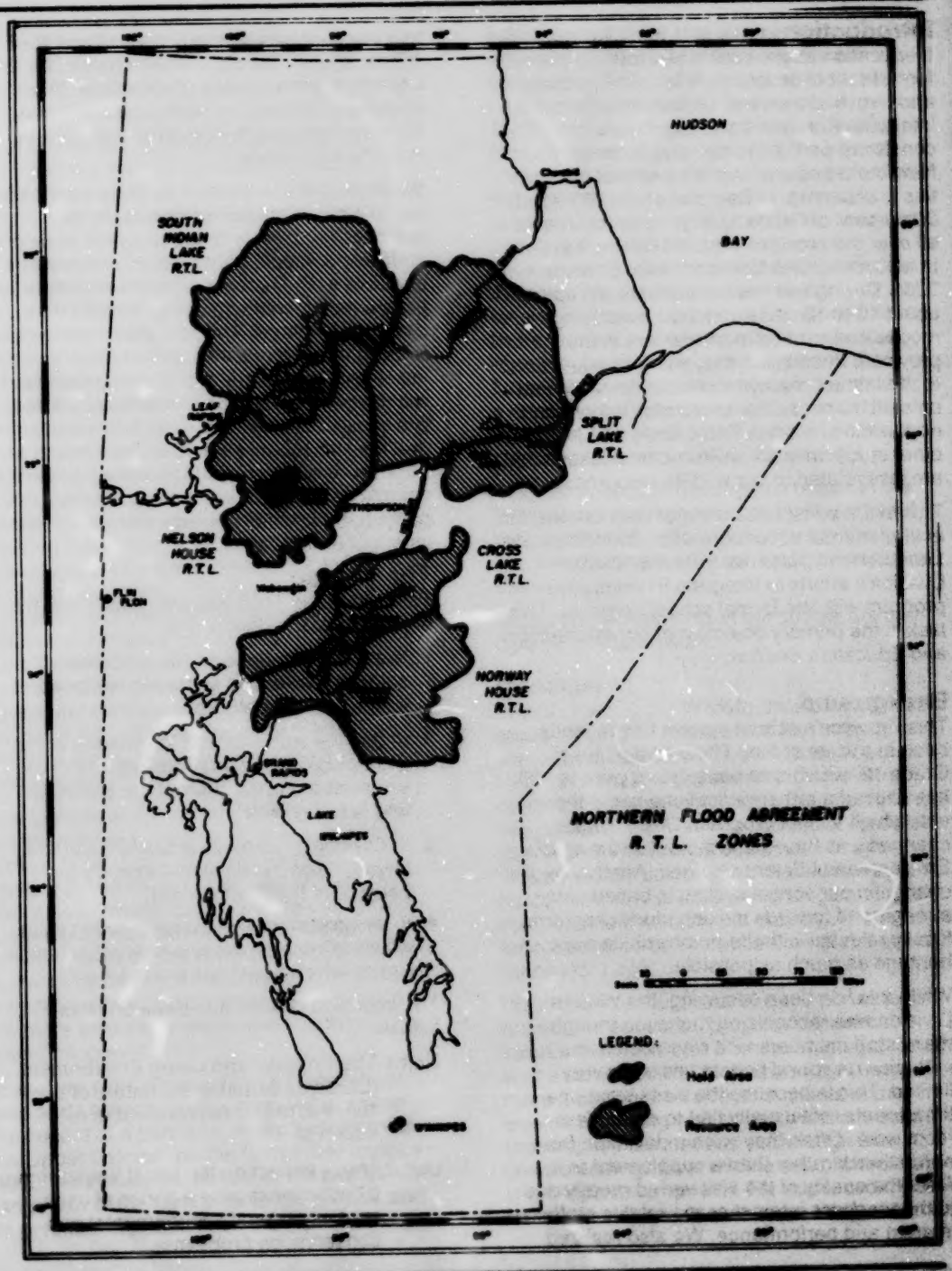
Special information seminars have been held with the Board on topics ranging from government policy to wildlife biology. Board representatives have been provided with a specially compiled wildlife information manual for the area, which deals with government programs, legislation, habitat capability maps and other resource information. The Department of Natural Resources has placed high priority on providing technical assistance to the Board and other parties to the agreement. Fur managers, for example, have devoted much effort to assist the Board and Manitoba Hydro in developing trapline compensation programs, providing data on fur markets and harvest and responding to trapping concerns expressed by the Board.

The Board also provides a forum through which the representatives can gain access to other government departments and agencies; a problem encountered by many people, but especially those in remote communities. Whatever the issue, the concerned party can be either answered or referred to the appropriate agency.

Commitment to a consultative approach based on communication, while not replacing compensation for disruption of life or livelihood, can bring government managers and local people to closer understanding which can only result in wiser use and management of natural resources. Attitudes of cooperation are being fostered and are evolving.

An overall improvement in communication and a spirit of teamwork both bode well for better understanding between native people and resource managers. The consultative efforts of all parties on this Board should pave the way for exciting wildlife management initiatives, not only in the area covered by the Northern Flood Agreement but throughout northern Manitoba.

Ross Thompson
Harvey Payne


HUDSON
BAY
SOUTH INDIAN LAKE R.T.L.
SPLIT LAKE R.T.L.
NELSON HOUSE R.T.L.
CROSS LAKE R.T.L.
NORWAY HOUSE R.T.L.
NORTHERN FLOOD AGREEMENT
R. T. L. ZONES
LEGEND:
Hold Area
Resource Area

Wildlife Management Becomes Part of Provincial High School Curriculum

Introduction

If education about wildlife has found a place in formal school programs, it is usually obscure and largely dependent on individual teacher interests. Rarely is it a recognizable and consistent part of the curriculum. In the Newfoundland and Labrador school system this is changing. In September of 1983 about 30 percent of Grade 12 high school students all over the province enrolled for the first time in a course called Environmental Science 3205. During this course students will spend about 10 to 12 classroom hours studying moose and caribou management in the province. In addition, they will give equal time to the impact of a hydroelectric development on caribou herds, the arctic char fishery and northern cod stocks. The course also includes other study units on environmental issues that are less related to our wildlife resources.

This event constitutes a major step forward for environmental education in Newfoundland and Labrador and particularly for the Wildlife Division's efforts to integrate its education program with the formal school curricula. This task is the primary objective of our Information and Education Section.

Background

This Province's school system has recently been in a state of flux. The introduction of Grade 12, which was nonexistent prior to 1983 has caused a rather radical change in the entire high school program. One of those changes was the establishment of the new Environmental Science course. Another recent change in our school system is based on a strong trend towards making study programs locally relevant with the emphasis on our own heritage as much as possible.

While this has been occurring, the Wildlife Division was recognizing that even though many staff members visit classrooms, our influence on young people has been very limited. This is because the visits were one-time events, not usually tied to other classroom work. Often they were a deviation from normal work rather than a supplement to it. Also, the quality of the visit varied greatly due to the teacher's interest or the wildlife staffer's interest and performance. We also realized that our staff was simply too small and the school system too big and widespread for this delivery system to work successfully. In spite of these problems, we recognized that over the long-term, youth in schools were our most important audience.

We believe that a solution to these problems lies in placing greater emphasis on the teachers for delivery of the program while our staff play a supplementary role. In this way students would receive a consistent education program that would be designed to fit their development level. This is a grand concept but is fraught with almost insurmountable implementation barriers and difficulties that I will not examine here. Nonetheless, we had previously communicated our interest in integrating with school studies to Department of Education, so when the high school curriculum change came about, we were invited to participate. Needless to say, this was greeted as a "gift from heaven."

The Course

The Department of Education states that the objectives of the course are:

1. to extend and build on the processes of science introduced at the elementary and junior high school levels;
2. to provide students with knowledge about the biological and physical aspects of the environment at an appropriate technical and reading level;
3. to develop in students a positive attitude towards using and yet maintaining the balance of the environment;
4. to develop students' critical thinking skills which will enable them to analyze scientific issues which affect our environment.

The course is divided into three units as follows:

Unit 1. The Physical and Living Environment (Students examine the nature of our renewable and nonrenewable resources).

Unit 2. Man's Impact on the Local Environment (Students examine a series of case studies on local environmental and conservation problems).

Unit 3. Global Environmental Issues
(Students examine problems such as acid rain, nuclear energy, tropical forest destruction, etc.)

About 60 percent of the course focuses on Unit 2 and the information base for this unit has been compiled as a series of case studies by a number of government and non-government resource agencies. The first of these case studies is *Moose and Caribou Management* and was written by the Wildlife Division. In this study students examine the history of our herds and their harvest, the current annual value of these resources, and the management strategy employed to maximize this value while ensuring the long-term conservation of these species. Then students act as biologists whose jobs are to set hunting quotas for certain areas. They examine how populations are estimated and the various growth and limiting factors affecting them. Next they calculate actual harvest quotas for three areas, one with a declining population, one with a stable population and one with an increasing population. Finally they discuss the whole management program, the role of the public, the influence of poaching and the future of moose and caribou in the province. As well as the classroom studies, there are projects and activities requiring independent work away from schools.

Now the role of our wildlife staff is to visit with as many of these classes as possible, show films or slide shows that are particularly relevant to the course, and lead students in discussion through topics that they already are spending considerable time examining. This activity makes the course more relevant to the students by adding a new, real-life dimension. We also believe that our important messages are more effectively assimilated by these young people.

In another case study written by Newfoundland and Labrador Hydro, students examine the impact of a particular hydro development, the Upper Salmon, on the Grey River caribou herd. They study the nature of the project, the range use of the herd prior to the project, and its potential impacts. Then they look at the actual impact study that was performed on the herd and is still continuing today. Radio telemetry was the primary tool used to determine changes in the herd's movements so this technique is examined in some detail. Since the project is so new and the impact studies are ongoing, firm conclusions cannot be reached but valuable lessons from this work unit include: caribou herds are sensitive to developments within their ranges; developments must be studied to determine their true impacts and these studies must be long-term; the developers are responsible for these studies; radio telemetry is a valuable research tool in wildlife management; the future of our environment always depends on a number of choices each with its associated trade-offs and good decision-making requires objective evaluations of all the issues.

Teacher in-service training has begun in the form of short workshops held by Department of Education and more is planned in the form of a summer institute at the local university in 1984.

Increasing enrollments in the course are anticipated in future years.

Conclusion

In this situation the Wildlife Division was not so much an initiator of the event (i.e. integration with school curriculum) as it was an opportunist that recognized the changing state of affairs in the school system, had established key contacts and was in a posture of readiness to proceed. Normally these kinds of opportunities simply do not exist. The school system tends to be very resistant to change and rarely open to influence from the outside. There certainly seems to be evidence here that there is reason for hope.

We recognize that those of us responsible for the wildlife education program cannot be satisfied with this one element of integration. It is at a senior level in high school and even there it does not involve all students at that level. It is dealing with issues without a solid foundation in awareness, knowledge and understanding about wildlife established early in a child's development. For this reason, we remain committed to even more integration of

wildlife education with school programs and are looking to *Project Wild*, the new supplementary program that will soon be available to Canadian wildlife agencies, as the vehicle for achieving this.

Post Script

With so many high school students becoming introduced to moose and caribou management and the role of hunting in that process, we are focusing on teachers of this course and other high school teachers as potential volunteer instructors for our new, revitalized Hunter Education Course. We are trying to get it established as an approved extra curricular activity for high school students. It would be a natural spin-off for many students to pursue their newly aroused interest in moose and caribou by taking this course. Hopefully more on this will be reported in next year's edition of Canadian Wildlife Administration.

Dennis Minty
Co-ordinator Information and Education

Grade 12 high school students are performing as would-be biologists and setting hunting quotas in selected management areas during a new course, Environmental Science, that was recently established in the Province's schools.
D. Minty Photo

Operation S.P.O.R.T.

— An Anti-Poaching Campaign

Introduction

C.A.P., R.A.P., T.I.P., O.G.T., S.P.O.R.T. If any of these acronyms look familiar you are probably aware of some of the antipoaching campaigns that have been established in many of the United States during the last 5-6 years. Their full titles are Citizens Against Poaching (Idaho), Report All Poaching (Michigan), Turn in a Poacher (Ohio), Operation Game Thief (New Mexico) and Sportsmen Policing Our Ranks Together (Pennsylvania). They are all based on toll-free, telephone hot-lines for citizens to report poaching activity. They grew out of serious concern over the number of undetected poaching violations that were revealed in several studies. It was found that about 1-3 of every 100 poaching violations were actually detected and that illegal harvest rates were alarmingly high.

In the summer of 1983, it was decided to test the feasibility of this kind of program in one area of Newfoundland to see if our citizens would get involved. It was christened Operation S.P.O.R.T. which, in our case, stood for "Stop Poaching, Report Today." The "O" was drawn as a target and the program has the subtitle, "Make Poachers Your Target." The word SPORT was selected as the logo because, as it says in the promotional materials, "Being a SPORT means being fair, responsible and community-minded. It means that you do not tolerate the criminal behaviour that hurts others and the environment. It means showing that you care."

Background

The introduction of Operation S.P.O.R.T. was one of a series of recent initiatives in the province to deter big game poachers. The first, in December 1982, was to establish much stiffer penalties for convicted violators. Fines for a first time offender went from $500 - $1,000 to $1,000-$5,000. Those for a second-time offender went from $1,000 plus a jail sentence to $3,000 to $10,000 plus a jail sentence. The next initiative was to increase the protection staff by three new full-time officers. This was the largest increase in staff for many years.

When he announced the establishment of Operation S.P.O.R.T. the Minister stated at the press conference:

"I believe that a substantial number of the people in this province want to bring poaching under control. In some areas it is causing declines in our moose and caribou populations. People realize that if this is not stopped, populations will dwindle until there are too few animals to be of use to anyone. At one time, poaching was less serious than it is today. There were fewer people creating fewer pressures on wildlife and there was an abundance of animals. Unfortunately, we grew accus-

tomed to the idea that there was little harm in taking a moose or caribou each year, licence or no licence. But times have changed. If this attitude continues, our tremendous wildlife heritage will disappear. In some of our communities market hunting exists. Poachers find it economically viable to operate this way. But this could not happen if community residents considered this to be intolerable behavior.

If poaching is tolerated and accepted by the public, protection officers have little hope of controlling it . . . Public co-operation and involvement is essential if we hope to control poaching and allow our children to experience wildlife as we can now.

The Program

The objectives of Operation S.P.O.R.T. are to:

1. increase the incidence of public-reported poaching violations by 50 percent;
2. reduce the time between the witnessing of a violation and the reporting of it to authorities;
3. increase the number of successful prosecutions as a result of public reported violations by 30 percent;
4. provide the public with an opportunity to be actively involved with wildlife conservation;
5. serve as a deterrent to poachers by raising their awareness of the anti-poaching sentiment in the general public."

The program was established in one area of the Province involving about 30 communities one of which, Corner Brook, has a population of 24,000. Three promotional items were distributed in the licence packages to big game hunters in these communities. These items include a brochure that answered the questions: What is Operation S.P.O.R.T.? Why do we need it? How does it work? What should I do if I see what appears to be a violation? How do I recognize poaching activity? Can I remain anonymous? and What happens after I report? The second promotional item is a bumper sticker that said, "Report Poachers! Call Zenith . . ." The last item is a wallet-sized, violation report card that indicates the details that should be recorded and the number to call.

Besides distributing these to licenced hunters, they are made available to anyone requesting them in the pilot area.

When a call is received the caller is put through to Wildlife Division staff during normal business hours or to an answering service after business hours. The answering service have report forms to take down the details from the caller. No matter who the call goes through to, a wildlife officer in the area of the reported violation is alerted as soon as possible.

It has been shown in other areas where this kind of program has been operating, that press coverage of some results is vital before a meaningful number of calls begins to come in. With this in mind press members have been invited to request frequently the latest figures on the number of calls received and the results of investigations carried out in response to those calls.

One of the very significant differences between our program and most of those in the U.S. is that *no* reward is offered to callers whose reports lead to convictions. It was decided to test the concept without this fringe benefit first, then to evaluate its need after a year or so.

The approximate cost of the program for about 6 months of service, including the promotional materials but excluding costs of staff time that has gone into development and implementation, will be about $7,000.

Results

The program is only about six weeks old at the time of this writing. About 2,000 packages of the promotional materials have been distributed. Twelve calls have been received reporting perceived poaching activity. Most did not provide adequate or accurate information that could lead to a prosecution, however one call has led to five separate charges being laid against five individuals and the seizure of a vehicle; the court case has not yet been heard.

Although we are relatively satisfied with the program so far, in a way, we are still looking for a breakthrough with the program, evidence to show potential callers that the program

works. However, the deterrent value of this effort is probably its greatest benefit and is one that is very difficult to measure over the short term. Reports from the field, the placement of bumper stickers, and the support from the press all tend to indicate that it is already a worthwhile program.

We anticipate greater use of the hot-line after the hunting season is over. Then poaching activity will be more evident since anyone handling firearms or meat outside of the open season will be a suspect.

Future Development

Expansion or modification of the program depends on the results achieved in the pilot area. However it is likely that it will be expanded to provide province-wide coverage during 1984-85.

Dennis Minty
Coordinator, Information and Education

Report Poachers!
Call Zenith 07058 Toll Free
Operation S.P.O.R.T. Wildlife Division

Northwest Territories

Planning for the Future

-Environmental Planning and Assessment

Non-renewable resource development activities have increased dramatically in the Northwest Territories in recent years. Hydrocarbon development in the Beaufort Sea is in the final stages of approval; the Norman Wells oil pipeline is under construction from Norman Wells to Zama, Alberta; plans are being prepared to build more oil and gas pipelines down the Mackenzie Valley; hydroelectric projects have been proposed on the Liard and Slave Rivers which may affect water regimes for hundreds of miles northward along the Mackenzie River; and several mining developments across the Territories are proposed. Accompanying all this, is increased road construction and air traffic, rendering previously isolated areas more accessible.

Development has placed a great deal of pressure on both the existing political and technical aspects of renewable resource management.

To assist the Government of the Northwest Territories in taking a comprehensive approach towards reviewing proposed developments and ensure that renewable resource options are maintained, the Environmental Planning and Assessment (EPA) Division of the Department of Renewable Resources was established in 1981. This division is responsible for providing an integrated response to the effects of non-renewable resource developments on the renewable resource base and its users. This goal is accomplished through land use and water resource planning, resource inventories, monitoring, participation in formal hearings and reviews, and by providing information to resource users affected by development. Major initiatives at present are focused on the implementation of a land use planning process, environmental impact assessment, regulatory review hearings, and strategies to enhance renewable resource use potentials.

Land Use Planning

Land use planning is being developed in the north as a process to determine the best uses of the land and its resources. It requires cooperative decision-making by federal and territorial governments, native groups, and other interest groups.

Renewable resource use is an important aspect of the territorial economy and an integral part of the northern life-style. Land use plans can be designed to ensure the conservation of those areas which are important for cultural, biological and aesthetic reasons. At the same time, they must provide a mechanism for the development of economic and social goals.

The federal and territorial governments and native groups have defined their roles within the planning process. At present, the guiding principles of a planning system are being discussed. Technical issues such as planning structure, data collection and public consultation are presently being refined.

The following general principles form the underlying basis for the development, operation and implementation of land use planning in the Northwest Territories.

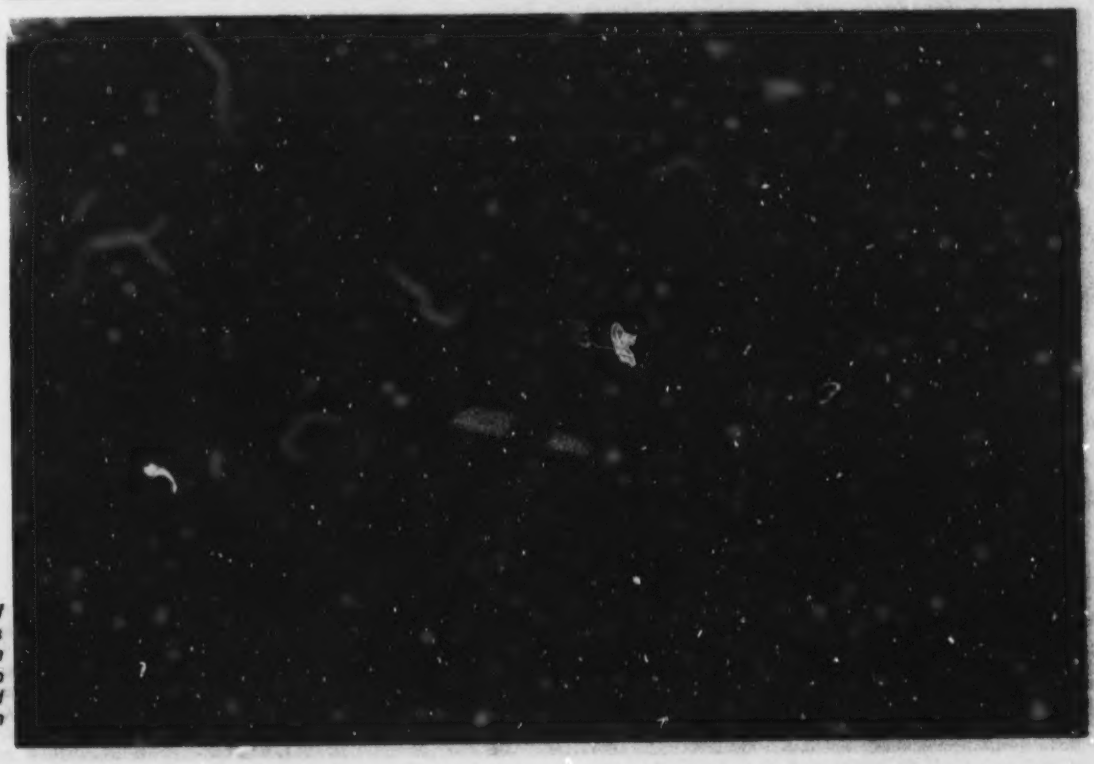
1) Man is a functional part of a dynamic biophysical environment and land use cannot be planned and managed without reference to the human community. Accordingly, social, cultural and economic endeavours of the human community must be central to land use planning and implementation.

2) The primary purpose for land use planning in the Northwest Territories must be to protect and promote the existing and future well-being of the permanent residents and communities of the Northwest Territories, taking into account the interests of all Canadians. Special attention shall be devoted to protecting and promoting the existing and future well-being of the aboriginal peoples and their land interests as they define them.

3) The planning process must ensure land use plans reflect the priorities and values of the residents of the planning regions.

4) The plans will provide for the conservation, development and utilization of land, resources, inland waters and the offshore.

5) To be effective the public planning process must provide an opportunity for the active and informed participation and support of the residents affected by the plan. Such



Rayaka Island, one of six artificial islands under construction in the Mackenzie River to facilitate oil field expansion at Norman Wells, N.W.T.

participation will be promoted through means including: ready access to all relevant information, widespread dissemination of relevant materials, appropriate and realistic schedules, recruitment and training of local residents to participate in comprehensive land use planning.

6) The planning process must be systematic and must be integrated with all other planning processes and operations.

7) It is acknowledged that an effective land planning process requires the active participation of the Government of Canada, the Government of the Northwest Territories, and regional and territorial organizations representing aboriginal people.

8) It is recognized that the funding and other resources shall be made available for the system and be provided equitably to allow each of the major participants referred to in paragraph 7 to participate effectively.

Conservation Strategy

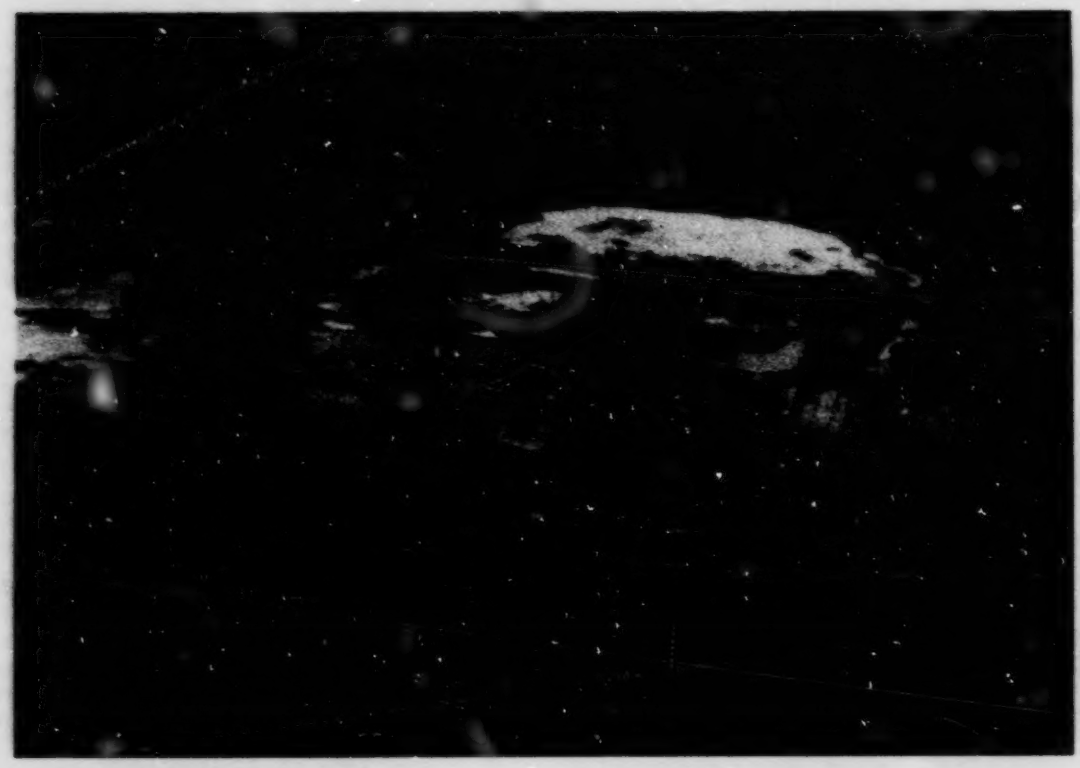
The federal government has initiated an effort to develop a comprehensive conservation policy and strategy for the Northwest Territories and Yukon. A Task Force has been established with territorial representation and will provide advice and direction for a broad northern conservation policy framework and implementation strategy.

Conservation may be divided into two components:

1) the wise use of all natural resources in order to maintain their biological productivity while taking into account the needs of resource users, and

2) the management of designated geographic areas to maintain representative or unique ecosystems.

The development of a strategy for northern conservation must extend beyond the federal



An abandoned well-site on the arctic coast two years after restoration. Exposed pilings indicate that slumping has occurred.

government's mandate and interact with the responsibilities of other government agencies. It must involve not only territorial and national interests but also international conservation concerns.

In developing recommendations, the present situation in the Northwest Territories must be taken into account. This includes:

1) territorial and federal legislation related to resource management and utilization, such as pollution control, land and water management, protection of fish and wildlife populations and archaeological and historical resources.

2) land use planning processes.

3) constitutional development in the north.

4) land claims settlements.

5) resource use.

As well as this existing situation, there are current conservation initiatives already underway, such as heritage river planning studies, proposals to establish additional national parks, a wildlife management policy, and a marine park and wetlands policy.

The Department of Renewable Resources will provide recommendations regarding the role of the Northwest Territories in a conservation strategy. The Government of the Northwest Territories must be able to reflect its interests in conservation due to the importance to northern residents of renewable resources for economic and cultural reasons. Conservation initiatives should be treated as an important element in directing future land and resource management decisions.

Environmental Impact Assessment

Environmental Impact Assessment in the Northwest Territories is a complex process

Cadillac Exploration Ltd. lead-zinc-silver mine on Prairie Creek, 30 miles north of Nahanni National Park.

which begins with the issuance of land use permits. The Department of Renewable Resources provides input into the permit process through the Land Use Advisory Committee (LUAC), a joint Federal/Territorial review committee. After several years of exploration, a company may have proved that sufficient reserves exist to develop a resource. At this point the project will be referred to the Regional Environmental Review Committee (RERC). This is a joint Federal/Territorial committee, which assesses the potential environmental impacts associated with a proposed resource development project. The committee recommends to the federal Department of Indian and Northern Affairs whether a project can be handled under the standard regulatory process or whether it should be referred to the Federal Environmental Assessment and Review Office (FEARO). Most projects, such as mining developments, proceed under the standard regulatory process. However, major developments, such as hydrocarbon projects, are exposed to a formal public review, including the Environmental Assessment and Review Process (EARP) and the National Energy Board (NEB) review, to determine social, economic and environmental feasibility and acceptance.

The Department is presently involved in two major resource development projects, which include: Beaufort Sea development and Norman Wells oil field expansion and pipeline project.

A) Beaufort Sea Development

The federal government has appointed an EARP panel to review potential development in the Beaufort Sea in order to determine whether any significant environmental or socio-economic effects would result. Hearings are held to judge the extent

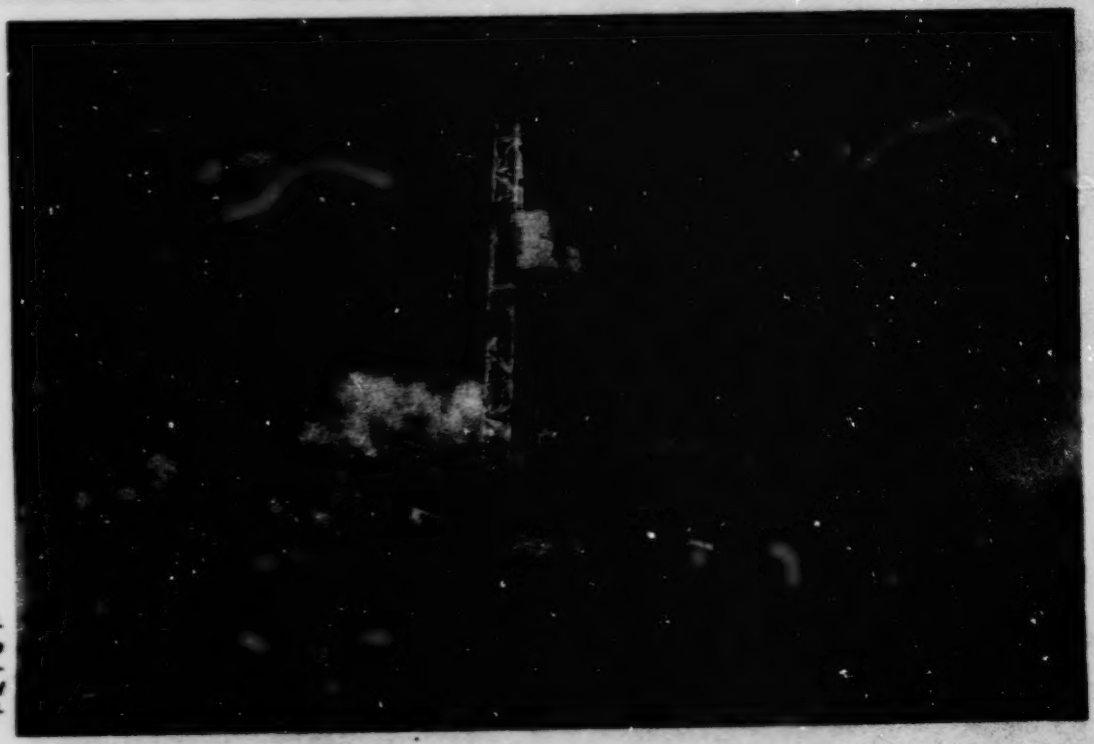
The town of Tungsten, N.W.T., was built to develop a major tungsten deposit on the Mackenzie Mountains near the Yukon border.

of environmental and social impacts and the desirability of allowing a project to proceed. This forum provides the Government of the Northwest Territories with the opportunity to ensure that the renewable resource management concerns of northerners are addressed and that adequate compensation is provided for resource users who are affected.

The Beaufort EARP hearings began in mid-September 1983 and will continue in various locations across the Territories until the end of the year. The Department of Renewable Resources has taken the opportunity to present its concerns regarding the environmental effects of oil and gas production and related transportation corridors in the Beaufort Sea region. The evidence will cover the following topics:

1) The potential effects of increased industrial activity on Beaufort Sea polar bears.
2) Bear/human conflicts with the increased human activity in the area.
3) Assessing responses of ungulates to industrial activities and studying the effects of those activities on the animals.
4) Management of wildlife habitat in the Northwest Territories.
5) The changes in harvest patterns resulting from increased industrial development.
6) The Norman Wells oil field expansion and pipeline project: response and responsibilities of the Department of Renewable Resources.
7) Contingency planning and the control of contaminants in the Northwest Territories.

The intent of the evidence is to inform the panel on a particular subject, to explain potential effects of increased development



Summer drilling activities for oil and gas in the Mackenzie Delta. Resupply and transport of personnel is by helicopter only.

upon the environment, and to suggest recommendations.

B) Norman Wells Oil Field Expansion and Pipeline Project

The Norman Wells Oil Field Expansion and Pipeline Project is the largest single project in the Northwest Territories since the construction of the DEW line sites. The project has gone through an EARP review as well as NEB hearings and is now being handled under the Standard regulatory process. The construction of the Norman Wells pipeline by Interprovincial Pipelines Limited (IPL) is proceeding on schedule whereby the main line construction and the second year of clearing operations will begin early in 1984. Oil field expansion facilities, including the construction of three artificial islands in the Mackenzie River, is about sixty percent complete and will be completed during the summer of 1984.

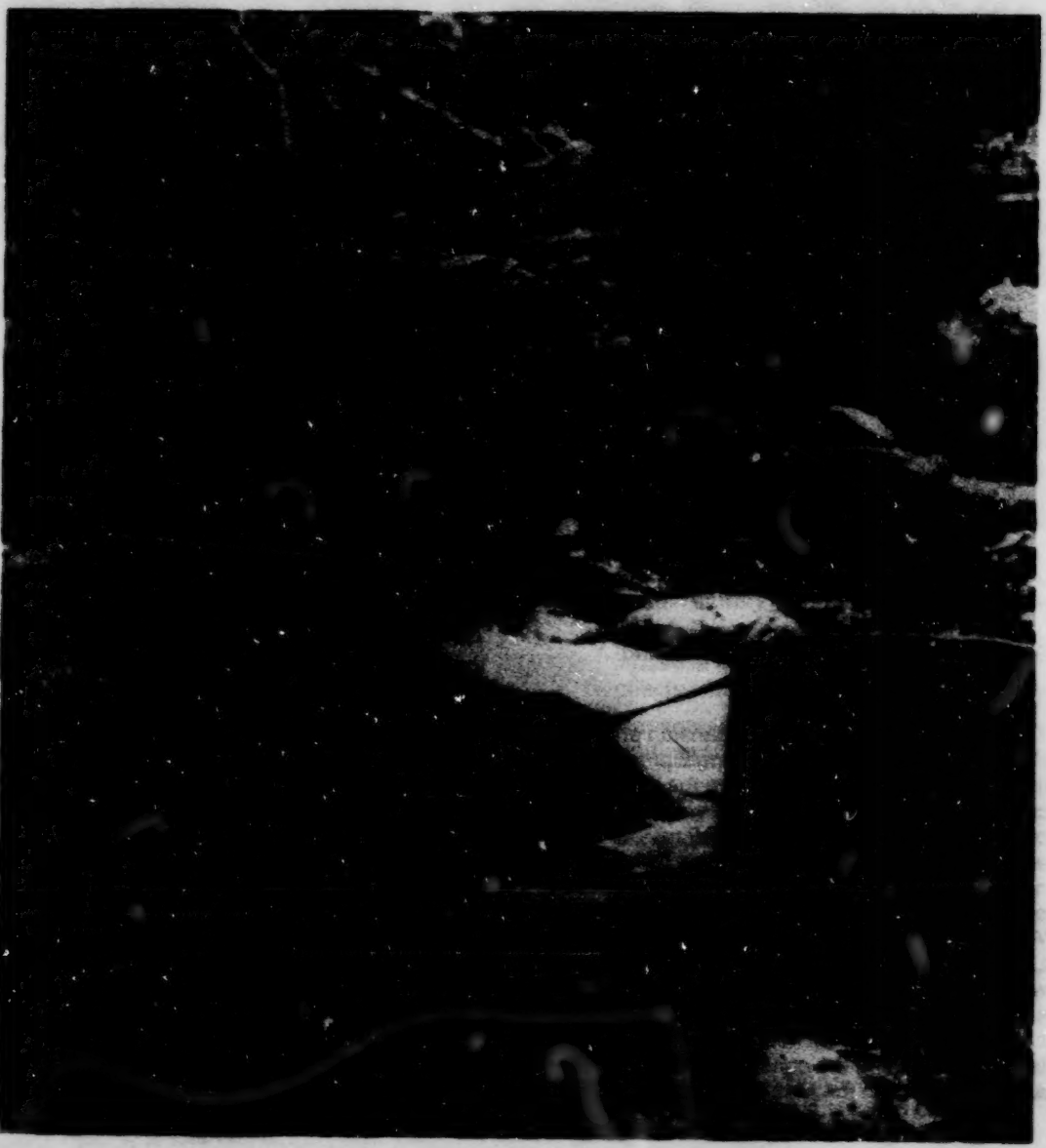
The role of EPA is to review and field check the compliance by IPL of environmental terms and conditions imposed on development permits and to study environmental documents submitted by IPL as required by the NEB. These include contingency plans, monitoring programs and an environmental protection plan. EPA also conducts scientific monitoring programs concerning the Norman Wells pipeline. This is to help determine the effects of pipeline construction on the wildlife and renewable resource users of the southern Mackenzie Valley.

The above examples present only a few illustrations of the types of renewable resource management issues confronting the Department of Renewable Resources. The department is also actively assessing several mining

projects and will become involved when other projects are proposed.

The EPA division provides the Government of the Northwest Territories with the capability to better understand and plan for the future maintenance of both the mutual environment and renewable resource use options.

Ron Livingston and Bob Larson
Environmental Planning & Assessment



Resource harvesting is an integral part of the lives of many people in the N.W.T.

Conservation Education

What Is It?

The history of our attempts to answer this question in the Northwest Territories is instructive. If nothing else, it points out something which all of us, as both civil servants and managers of wildlife, perhaps need occasional reminding of — that the solutions we reach are seldom final.

Originally our Conservation Education section began life as patron for a group of northern students attending resource school in Alberta, and as the organizer of in-service training programs (e.g. enforcement courses for Wildlife Officers). This changed after the Northwest Territories acquired its own Renewable Resources Technology Program at Thebacha College in Fort Smith. The need to sponsor students vanished, but was just as quickly replaced by the role of coordinating the massive public relations campaign that attended the formation of the current Wildlife Ordinance. Spearheaded by Conservation Education, the entire Department of Renewable Resources bent itself toward the democratic process of community consultation and logislative debate in forging a new legal instrument to manage wildlife in the Northwest Territories.

As the section evolved, it shed its training responsibilities (including firearm safety), its supervision of our department's reprint library, and its involvement in the production of technical reports. Finally, in 1983, we formally defined conservation education as "communicating the need for conserving wildlife and protecting the environment." Five specific objectives detail this activity:

1. Provide general information about wildlife and the environment.
2. Encourage an understanding of the different uses and values of wildlife and the environment.
3. Alert people to the effects of man's activity on wildlife and the environment.
4. Explain to the public in a straightforward manner how and why wildlife and the environment are studied.
5. Explain how the results of studies are transformed into actions affecting the public (e.g. laws, programs, policies).

The duties of the section continue to include public relations and information services not directly related to conservation education. However, it is difficult to identify the point where one begins and the other leaves off. For example, maintaining a creditable image of our department (i.e. public relations) has the same long-term goal as conservation education and wildlife management — conserving the resource. Ensuring that conservation education materials reach the audiences that they are intended for is an essential step in the job — yet at first glance updating a mailing list, stuffing envelopes, and controlling inventory seem more chaff than kernel.

Whose Job Is It?

One often hears it said that wildlife management really means people management. Or in other words, human beings are themselves the authors of most trends in wild populations which we are now trying to modify. Obviously it matters little if we have all the biological data necessary to manage wildlife effectively, but cannot arrange the compliance of people. While such an extreme situation is rare, lesser variations of it are not. This could lead one to challenge the traditional relationship between the data gatherers and interpreters, who have always played a lead role in wildlife management, and the educators and disseminators of information, who have played a support role. Why should it not be the other way around?

Our department has placed conservation education high on its list of priorities, with money and man-years being reallocated accordingly. While the Conservation Education section at Headquarters in Yellowknife will continue to act as a production and distribution centre, regional conservation education officers will be expected to focus on matters of local interest and get involved in hands-on-projects. The current staff of five (three at Headquarters and two in five regions) may yet increase to eight if each region is able to come up with the necessary man-years.

But it is a mistake to think that spreading the message of conservation can be relegated solely to a few individuals. Conservation is after all, the reason for the existence of any Department of Renewable Resources, regardless of its location. Specialization may be a fact of life, but none of us should forget the ultimate goal of our work — whether he be an officer enforcing the law, a biologist counting caribou, or an administrator balancing budgets.

How Long Will It Take?

Although I cannot speak with absolute authority, if I were to hazard a guess it would be that the message of wildlife conservation has become rather firmly entrenched throughout the nation, and has been for some time. Longer, for example, than energy conservation or physical fitness.

Not so in the Northwest Territories. Here the majority of the population of the top third of Canada are native, and the customary references to native cultures hide the greater truth — they are part of a different civilization. The French, the English, the Greeks, the Turks, the Jews, all have more in common with each other than any of these with the Dene or the Inuit. The western civilization with Graeco-Roman and Judaeo-Christian roots had no point of contact with Canada's aboriginal people until the whalers and fur-traders came along. While this contact period occurred centuries ago in many parts of Canada, it is only within the present generation that many people in the Northwest Territories finally abandoned their traditional nomadic way of life.

When my father was a young man, he once met a part-time game warden at the wrong time of year on a back-country road. The deer season was closed but my father had some fresh venison slung over his shoulder. Times were lean in those days and the game warden looked the other way, but my father was well aware that he had broken the law. At about the same time in Fort Norman on the Mackenzie River, the very first game warden in those parts was introducing himself at a meeting. Unknown to him, his words were the source of much secret merriment. Having no way to translate "game warden," he had been introduced as "boss of all the animals."

Today, there are influential people in communities here who are opposed to the study of wildlife. The reasons are cultural as well as political. Consequently, the job of conservation education in the Northwest Territories is one which requires tact, insight, innovation, and time. Already we have come a great distance in a very short while, but it will take the span of at least another generation to pull us even with the rest of Canada.

What Does It Involve?

Moving from the five objectives laid out at the beginning of this essay to their actual realization is not a routine exercise. There are four factors which must be considered when formulating specific projects:

a) the audience

b) the medium

c) the issue

d) the cost.

Clearly identifying the audience sounds almost simplistic, yet it is often overlooked — the audience is not "everyone." It is also important because it can help define the medium. Since native cultures in the Northwest Territories are not print-oriented, most communication aids should be audio-visual in form. In this day and age, that means a moving picture format; the cost, however, is prohibitive. As a result, we find ourselves having to rely on printed matters as a foundation and audio-visual items as superstructure.

Our major programs are divided into three groups. The projects listed thereunder are in various stages of completion.

1) Printed Matter

Arctic Wildlife Sketches — Colourful pamphlets on northern animals similar in format to the Canadian Wildlife Service's "Hinterland Who's Who" series. So far nine have been produced (caribou, polar bear, muskox, wolves, birds of prey, moose, bison, Dall's sheep and whales) with more planned.

2ND EDITION

Arctic Wildlife Sketches

The cover of one of the pamphlets that are available for the public.

Polar Bear
of the Northwest Territories

Arctic Animals — A book on a wide variety of creatures found north of the treeline, including terrestrial and marine mammals, birds, fish and a few invertebrates. Each species is accompanied by a line drawing, brief text, and names in English, Latin and Inuktitut.

Caribou of the Northwest Territories — A book aimed at the general public, written in plain English, and packed with four-colour illustrations. Includes chapters on barren-ground caribou life history and status of major herds, woodland caribou, Peary caribou, reindeer, native utilization, research, habitat, management, legends, and outlook for the future.

Life History and Current Status of Muskoxen in the Northwest Territories — A non-technical report which includes a succinct zone-by-zone statement on status. Available at $5.00 per copy.

Life History and Current Status of Polar Bear in the Northwest Territories — A companion volume to the one above.

Trappers Manual — A collection of items of interest and importance to northern hunters and trappers, including recipes and food preparation, snowmobile repair tips, trap sets, a history of the fur trade in the Northwest Territories, the importance of humane trapping, profiles of hunters and trappers, how to make snowshoes, a spruce bark canoe, a komatik, an igloo, and so on.

NWT Wildlife Notes — Numbered updates on departmental activities in a newsletter format.

2) Audio-Visual Projects

Television Spots — A series of one-minute television spots on northern animals and departmental concerns. A different spot is aired each month.

Koukdjuak Crossing — a 16mm film which explains the 10-year caribou tagging project on Baffin Island.

Bathurst Caribou Hunters — a 16mm film which profiles people from three different ethnic groups hunting the Bathurst herd of barren-ground caribou. Shown are Inuit hunters on the arctic coast in summer, white sport hunters at the treeline in fall, and Dene hunters in the boreal forest in winter.

Videotape Programs — We are developing a videotape capability in the ¾" format. Shooting and editing will be done on ¾" tape, but copies will be distributed on ½" tape. Programs will not be broadcast quality; they are intended only as in-house productions for use by our staff at meetings, etc.

3) School Programs

Curriculum Development — Our department is working with the Department of Education to produce material relating to renewable resources for use in schools. A teachers' unit called "Populations and Population Management" has been produced for grade 9, and work on units for other grades is proceeding.

National Wildlife Week — A poster contest open to all Northwest Territories students is sponsored each year in connection with National Wildlife Week. In 1983, more than 1800 entries were received. Prizes are awarded and winning entries are reproduced on a single four-colour poster to publicize the following year's contest.

Outdoor Education (Inuvik Region) — This is a regional youth program consisting of six phases: wildlife management, firearm safety, important wildlife of the Inuvik Region, emergency first aid, bush living, and wildlife camp. This program is still in a developmental stage.

How Do You Measure Its Success?

Maintaining a balance, especially between printed matter and audio-visual projects, is essential. One way would be to rate each item numerically, then design a curve to describe one's budget, with highest ratings getting a larger share of money. Such a procedure would prevent all of one's budget being eaten up by minor projects. This would also be a way

of formally integrating audience, medium, issue and cost — something the reader may have noticed we did not address in the listing of projects in the previous section and which, in fact, we have so far been unable to accomplish in a systematic way.

Regardless of the method employed, it is essential that development follow some kind of orderly pattern. Only then will it be possible to gauge one's success over the short term.

As for the long term, the success of conservation education will be determined by the same criteria that our department will be judged by 20 years from now.

Ed Hall
Conservation Education

NWT WILDLIFE NOTES

Nunatiakmiut Anguhikiin Titigakhimayain

The masthead of the "Wildlife Notes" in English, western Inuktitut and syllabics, or eastern Inuktitut.

Northwest Territories

The Beverly-Kaminuriak Caribou Management Board And its Early Growth

The Beverly-Kaminuriak Caribou Management Board is a pragmatic example of resource management agencies and "users" joining forces to manage a common property resource in northern Canada. This paper highlights some reasons why early Board growth has been successful.

Distribution and Importance of the Beverly and Kaminuriak Caribou Herds

The Kaminuriak caribou herd spends the summer in the south-central Keewatin District of the Northwest Territories and the winter in southern Keewatin and northern Manitoba. In some years, the herd winters as far west as the northeastern corner of Saskatchewan. Since the late 1950's, the distribution of caribou in winter has slowly contracted and in recent years, the people of northern Manitoba, who enjoyed the use of this resource as far south as 57° latitude, have had little access to caribou.

The Beverly herd spends the summer west of the Kaminuriak herd and winters in the southern Keewatin and south-eastern Slave region of the Northwest Territories, and throughout northern Saskatchewan. At one time a portion of the Beverly herd spent the winter in north-eastern Alberta.

Many thousands of caribou are harvested from the Beverly and Kaminuriak herds each year. In general, the harvest is taken almost exclusively by native people. The caribou resource traditionally has been and continues to be, a mainstay for the people of the region.

For example, a study conducted in 1977 valued the use of caribou at $6,000 per household in Baker Lake.

Background to the Formation of the Board

In response to the perceived decline of caribou during the 1950's, the federal government gathered biological information with the cooperation of the provinces of Manitoba and Saskatchewan, and considered management strategies. Native users of caribou were encouraged by local wildlife officers and Indian Affairs personnel to provide kill statistics and in some cases, participated in projects such as caribou tagging. The communities were usually briefed informally on management initiatives, however, there was no standard forum for the Native "users" to become directly involved in formulating management programs.

Although no fully integrated management plan was formulated, a series of actions were taken in the 1950's and 1960's by the federal, provincial and territorial agencies to arrest the assumed decline of caribou in these two herds. The primary focus was to reduce mortality to the caribou herds by implementing a widespread wolf poisoning program in the caribou winter range and to encourage hunters to reduce their kill voluntarily. In addition, a forest fire control program was implemented in the Northwest Territories portion of the Beverly caribou winter range.

Implementation of these measures, and monitoring of herd status and harvest was viewed as the task of government. "Users" were encouraged to provide information on caribou movements and harvest. Interpretation

of the data and subsequent recommendations were influenced by officers with practical experience, usually speaking for the perceived interests of "users" of that jurisdiction. The administrative structures involved in this process were a technical committee which made recommendations to a management committee (caribou management group) consisting of representatives from each government agency responsible for implementing research and management programs on the caribou range. User groups were not represented on the management committee. In general, people believed that the Beverly herd had decreased by over 50 per cent between the mid-1970's and 1980 to approximately 100,000 animals. The data suggested that if the rate of decline persisted, within five years the herd would no longer be a significant resource. The Kaminuriak herd, although smaller in size, was declining at a precipitous rate (17 per cent over 25 years). It was no longer available to the Dene of Manitoba and Saskatchewan, and if the rate of decline persisted, would cease being a resource for the Keewatin Inuit in less than eight years.

The dependence of northerners on these herds and the continuing decline highlighted the need for improved management.

It was clear in the late 1970's that new efforts

The Beverly and Kaminuriak caribou herds often winter south of the tree-line in Manitoba, Saskatchewan and the Northwest Territories.

to develop an integrated and comprehensive resource management response were required if caribou were to be conserved. What was also clear was a growing appreciation by government that effective management could only occur if management programs were supported in principle by the "users" of the resource at a local level.

Although the coordination of the agencies could be organized, this alone would not be sufficient for public understanding of the programs necessary to permit the herds to recover.

In essence, the management problem was that annual harvest exceeded recruitment into the caribou population. Although some management measures could contribute to herd recovery, these measures could never succeed without harvest management which had local support.

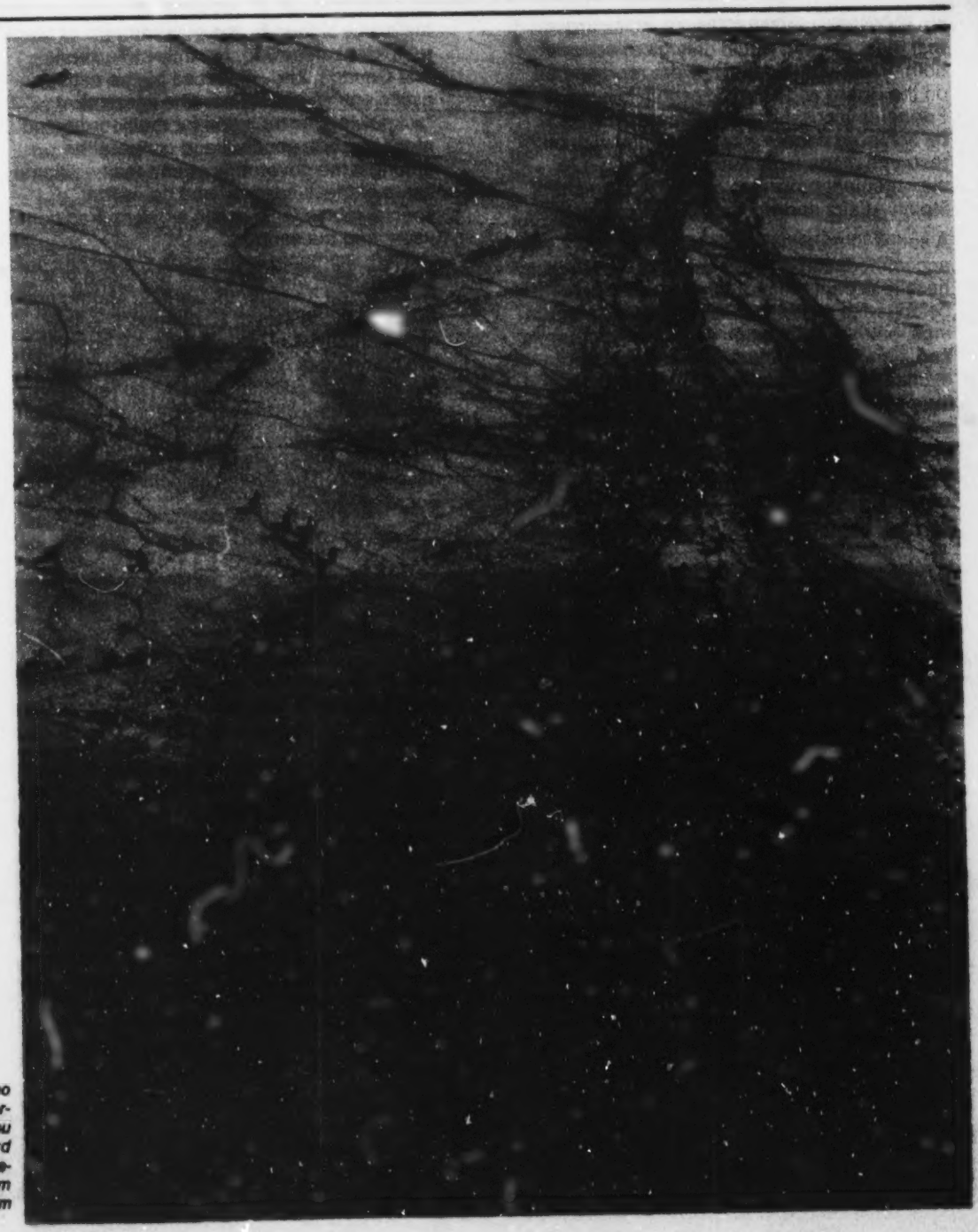
Government attempted to deal with the problem. However, although Northwest Territories Hunters' and Trappers' Associations had been actively involved in programs such as polar bear management (data collection and harvest allocation), statements by government that caribou were declining were received with skepticism at best, and at worst, were interpreted as outright deceit. Opinions were, in a word, polarized.

Statements about declining caribou herds were hard to understand by those who lived where the remaining animals congregated. Many felt the caribou had moved elsewhere, particularly north. Some who believed the herds may have been declining blamed a perceived disturbance associated with the recent increase in mineral exploration near the calving areas. If a decline was occurring, it was viewed by some as negatively affecting the position being advanced on behalf of native people in land claim negotiations for greater responsibility in the area of wildlife management.

The residents of the region had moved into the communities since the more rural life of the 1960's and, during this period, there was unprecedented political development in the Northwest Territories, including the organization and growing sophistication of local and regional associations. Clearly, this environment was not conducive to building a bridge in understanding between the traditional and technological perspectives. Similar changes had occurred in northern communities of northern Manitoba and Saskatchewan. In the provinces, the recognition of a "problem" in relation to caribou was clearer — often there simply were no caribou available. However, the reasons why were less than apparent and suspicion towards government prevailed.
In the Northwest Territories, legislation exists which would permit government to restrict harvest of caribou by native people. Clearly, however, the application of such laws required acceptance by those who will be affected. The reasons for this are twofold: (1) heavy enforcement was seen as regressive, (2) enforcement is costly and difficult in a land as vast as the Northwest Territories which is sparsely populated and where access is primarily by air. In the provinces, legislation does not presently exist to control hunting by native persons on unoccupied Crown land. More importantly, management must involve the people which are to be served — primarily native people. For example, population targets, selective harvest and resource management trade-offs must be chosen by those with a primary interest in the resource.

An interjurisdictional Caribou Management Board with representation by both governments and "users" was suggested as a solution to the caribou management problem. However, although both sides were keen to progress, several native organizations were concerned that land claims would give them more control of wildlife management than participating on a joint board, and that participation on a joint board before claims were settled could prejudice claim negotiations. Although government provided assurance that participation by native people would not be prejudiced by claims, some native people thought they would be better off with a board consisting entirely of users.

Government representatives were viewed as being protective of ministerial mandates and tied to preconceived ideas of bureaucratic



Since caribou know no boundaries, an inter-jurisdictional Caribou Management Board was formed with representation both from governments and from "users."

structure and function. The agencies argued that management would only be effective if both "users" and agencies were represented on the Board and shared responsibilities. Further, successful management could only be achieved if there was integration with other resource management programs (e.g. fire management programs of the Department of Indian Affairs and Northern Development).

A series of meetings gradually led to an accommodation of views and a general willingness to accept the problem as one which belonged to all those involved. Public meetings, public participation in field programs, and a major film project were used to aid an exchange of views between governments and the public in the Keewatin. Each party achieved a better understanding of the positions of the others.

The Management Agreement

On June 3, 1982 the Beverly-Kaminuriak Barrenground Caribou Management Agreement was signed by the governments of Manitoba, Saskatchewan, Northwest Territories and Canada, and witnessed by the native associations concerned. The agreement "acknowledges the need for the coordinated management, goodwill and cooperation amongst the governments and the traditional users of these caribou" and notes that "a special relationship exists between traditional users and the caribou."

The agreement enables the formation of a Beverly and Kaminuriak Caribou Management Board that consists of 13 members — five representatives of the government agencies, two community representatives from each of Manitoba and Saskatchewan, two representatives from the Northwest Territories Keewatin Wildlife Federation, and one each from the Northwest Territories Dene Nation and Metis Association. The overall objectives of the Board are to:

The caribou resource traditionally has been, and continues to be, a mainstay for the native people of northern Canada.

– coordinate the management of the herds primarily for traditional "users" on the caribou range;
– to establish a process of shared responsibility for the development of management programs between the agencies and "users;"
– to encourage communication between the agencies, groups and public at large.

Specific herd management recommendations which can be made include: the establishment of harvest limits and allocation between jurisdictions, encouraging "users" participation in management programs, development and review of research proposals, harvest data collection systems and predator management programs. Recommendations for habitat management, and public information are also within the purview of the Board. The recommendations of the Board are provided directly by the Secretary of the Board to the appropriate ministers. The Board is funded by the government agencies and is required to file an annual report.

Land claim negotiations in the Northwest Territories have respected the principle of ministerial accountability to conserve wildlife resources and the need for governments to integrate those needs with other aspects of public government at the provincial, territorial and federal levels. Within this broad responsibility, ministers are accountable for staff resources, facilities and funds which they allocate to resource management programs. This arrangement is adhered to by the agreement. To reinforce the role of the Board, the interjurisdictional agreement and terms of reference of the Board require that if a minister does not intend to act positively to a recommendation, he must indicate his reasons to the Board within a reasonable length of time.

The geographic limits of the Board's concerns are defined by the traditional range of the

The calves of the Beverly and Kaminuriak caribou are born on the tundra of the Northwest Territories, west of Hudson Bay.

caribou herds. The interest of the board must clearly extend to recommendations on any factors that could affect caribou management such as land use planning.

Regional associations such as the coalition of South Slave Hunters' and Trappers' Associations and Bands, and the Keewatin Wildlife Federation bring their perspectives to caribou management. These groups are in a position to sub-allocate regional quotas to their respective communities based on their mandate from the local Hunters' and Trappers' Associations and Band Councils.

Local and regional wildlife management structures already exist for most of the Northwest Territories. A territorial Hunters' and Trappers' Federation has just been formed. The work of these groups will be integrated to ensure that the interests of northerners in wildlife management programs are represented in all levels of decision-making. The Caribou Management Board will provide the connection between these territorial structures and government agencies and "user" groups from other jurisdictions. The link between the Board and other public resource management committees and boards (such as the advisory committee on wildfire management) are just now being established. As well, links are being forged with some committees internal to government like the Canada/Northwest Territories Research Coordinating Committee.

An agreement-in-principle respecting wildlife has been negotiated between the federal government and the Inuit, the terms of which appear to be compatible with the Board. Specifically, that agreement gives a major role to a Nunavut Wildlife Management Board. However, this must be compatible with agreements negotiated between ministers with other jurisdictions involved in the management of shared resources.

The interests of non-native northerners have not been given a high profile. It will be important that responsibilities in this regard are clear before future harvest allocations are made. The option exists for government agencies to represent the interest of non-native northerners, or for these groups to appear and make their case before the Board, or for these groups to lobby directly with the respective ministers.

Growth of the Board

Since the signing of the Agreement, native groups and government agencies have appointed their representatives and the Board has had five meetings. These were preceded by several informal meetings while the formation of the Board was being considered. The Board elected one of the "user" representatives, James Schaefer, as chairman and one of the administrators, Rich Goulden of the Manitoba government as vice-chairman.

The usual approach of a standing technical committee to support the senior management committee (the Board) has not been followed by the Board. Concern was expressed by both "user" representatives and by the agency representatives that the technical group would be dominated by government personnel. The gulf between technical advice and "user" perspectives would be further aggravated. Concern was also expressed that the availability of a standing technical committee encouraged time lags in decision-making. The alternative approach chosen is that the Board provides firm leadership to small task groups whose composition varies with the issue of concern. These groups report their analysis and recommendations to the Board thereby increasing the learning opportunity for all concerned in decision-making.

The Board has decided to meet in communities on the caribou range to increase Board profile with its constituent groups. Communicative media are being developed such as films, school programs and newsletters. Conservation education has been the first priority of the Board and will be for some time to come.

A key priority has been the drafting of a management program for the two herds which is being carried out primarily by three members of the Board with progress reports at each meeting and further direction being provided on the various aspects of the plan. The plan is being developed by consensus and it will be the responsibility of the members

to keep the communities informed of its progress and to facilitate community input.

The management plan will eventually include specific targets for population levels and quotas, habitat management plans, and the other requirements of a species management plan. The plan will also include elements geared to maximizing benefit of the use of the resource, such as improved storage and use of the harvested animals.

While the Board is still in its formative stages it has nevertheless demonstrated considerable growth. There has been a reduction in the polarization of opinions as each party has gained an appreciation of the viewpoints of the others. A good portion of this growth can be attributed to the continuity of Board membership, the general goodwill and growing realization that all Board members are deeply committed to maintaining the resource, and the extensive preparation which precedes each meeting.

The Board has coped with the frustration it initially experienced when it attempted to grapple with the enormity of its task in two useful ways. First, each meeting focuses on one primary theme. The theme for the January 1984 meeting in Winnipeg was "herd status." Second, the Board is establishing operating procedures similar to Robert's rules of order, and meetings are physically structured so that observers sit apart from the Board table.

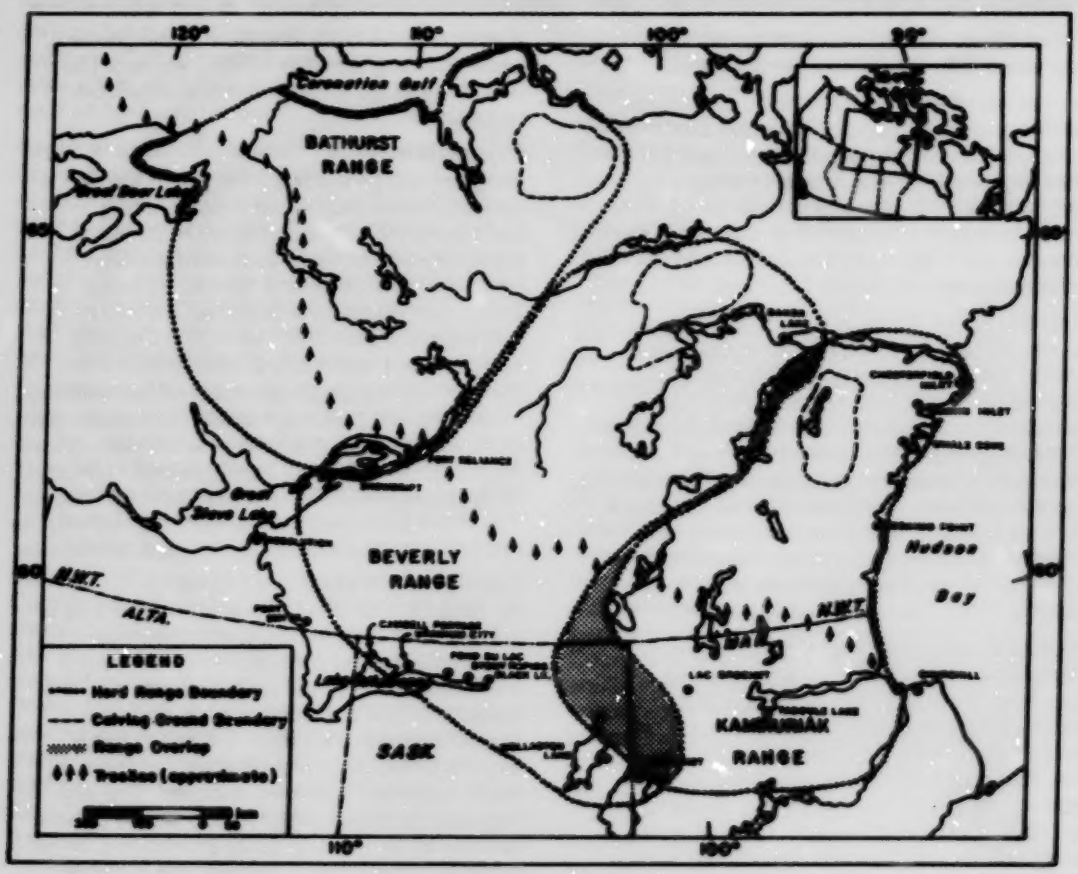
It is clear that there will be a time lag between the time that the Board agrees on an issue and the time that the communities and the agencies support that agreement. Board members from the communities face a particularly challenging task in conveying the progress achieved at a meeting to "their people." It is hoped that the newspaper "Caribou News" will contribute to the growing understanding and that holding some of the Board meetings in the communities will be helpful.

Conclusion

Progress will be made by the Board through a series of small successes yielding direct benefits to the communities while building credibility and consensus toward the days when the hard decisions have to be made. There may never be a day when an entire management plan is in place. The ongoing updating and improving of elements of the plan will constantly improve our effectiveness in meeting the national interest in general, and local and regional interests in particular. Additional Boards may be developed in the future to deal with other complex situations. The Porcupine Caribou Management Board appears on the verge of becoming a reality.

It is too early to point to the Beverly-Kaminuriak Caribou Management Board as a successful model of how to combine the requirements and contribution of northern traditional users of the resource with the benefits of current technological and integrated systems. However, it is felt that this experiment is off to a good start and there is much optimism that it will succeed. The key ingredients to positive progress will be good faith by all parties and an openness to proceed while accommodating change where necessary to advance toward the overall goal of conserving the resource and the use of that resource to meet changing needs to northerners. We have had the courage to take the first step. Current attitudes will promote further progress.

Hugh J. Monaghan



Distribution of the Bathurst, Beverly and Kaminuriak barren-ground caribou herds.

Osprey Relocation '79

Every once in a while an opportunity arises not only to practice "hands-on" wildlife management but to involve other private and public agencies in a project of wide-spread public interest. Such an opportunity arose a few years ago when the Nova Scotia Power Corporation became concerned about ospreys using their power line poles as nesting sites.

Fish are the major food of ospreys and, therefore, these birds are most commonly found nesting around the shores of shallow estuarine waters and inland lakes. The ideal nesting site for an osprey is the top of a tall dead tree close to food-rich waters. If these are not available however, live trees with dead tops, or man-made structures such as telephone and power poles or wharf pilings are used. Ospreys may nest 1½ kilometers or more from water if their food supply is abundant. Power corporation personnel consider the presence of these birds and their nests on the poles as threats to the security of electrical transmissions through the lines.

Representatives of NSPC and the Nova Scotia Department of Lands and Forests met to discuss the feasibility of relocating the birds from power pole nest sites to nearby substitute sites. Supplying artificial nest sites for ospreys has been practiced in the eastern United States for 30 years or more. Most of these schemes have been ad hoc ventures undertaken to increase nest sites in areas where their absence may be limiting osprey populations. Few attempts have been made to draw ospreys away from power line sites and onto alternate nest poles. As plans developed, it was agreed that NSPC would supply poles, and manpower and machinery to raise them in addition to removing nests from the power line. Lands and Forests would be responsible for marking the location of the substitute nest poles, obtain nest platforms, supply manpower to secure the platforms to the poles, help raise the poles and monitor the results.

A section of 69kV power line in an area known as Indian Path was chosen for the trial relocation. This power line, constructed in 1970, is within 1km or less of sheltered marine waters. The first osprey nest appeared on the line in 1971 and additional pairs established nests on power poles in succeeding years. By 1979 a total of eight pairs of ospreys occupied sites extending over a 5 km length of line. The birds became a local attraction and each spring, residents in Indian Path looked forward to the osprey's arrival and their subsequent nesting activities.

Work on the project began in the fall of 1979 with the marking of the eight alternate sites along the edges of the power line corridor near each existing power line pole nest. Platforms were donated by National Sea Products and Riverport Seafoods Limited, and consisted of large wooden reels which were cut to provide two circular pieces each about 1 metre in diameter. A centre hole was cut in each platform so that it could be slipped over the top of the pole. Additional supporting lengths of wood were attached to the underside of each platform and to the pole. Completed substitute nest poles were installed along the power line corridor and the power line nests removed after the electrical current was shut off. Unfortunately as it later turned out, devices to render the power poles unusable for future nesting were unable to be placed on the poles. Finally, some material from the destroyed nests was used to fashion a crude nest on each of the new nest structures to make them as attractive as possible to the returning birds.

In early April 1980, the first ospreys were reported in Indian Path, back from their southern wintering grounds. By the first week of May, the birds had built well-formed nests on six of the nest platforms and one site was unoccupied. At the remaining site, the birds rebuilt on the power pole. An aerial survey in mid-July revealed ten young ospreys in six nests. Five of these were on the platforms and the sixth was the rebuilt power pole nest.

This degree of success for the project was not expected since several of the new poles were shorter than the power line poles. Because of this problem, it was thought that birds at these sites would return to nest on the power poles. Yet that was not the case. Perhaps the crude platform nests made from the old nest material served as nest site cues for the returning ospreys. Also the nearly unrestricted horizon-

tal view-planes from the platform nests may have been important. Although Ospreys build nests on elevated sites which presumably provide commanding views, it seems that height relative to the surrounding terrain is the key to nest location. Records of other osprey nests show the birds nesting on low structures such as the protruding tops of drowned trees, and channel markers. Photographs of the horizon were taken from the nest rims of the Indian Path platform nests. At the site where the birds renested on the power pole, the photographs indicated that tall trees within 15m of the substitute nest site screened a portion of the view over nearby estuarine waters. Visual barriers such as these, may be crucial to the selection by ospreys of alternate nest sites.

Another osprey nest relocation project was undertaken a few miles south of Bridgewater, Lunenburg County. A power pole and transformer on which ospreys had built a nest, was to be removed in 1980 to enable construction of a residence for mentally retarded adults. It was suggested that after construction was completed, a pole and nesting platform could be raised for the ospreys. Later that year, a 17 m pole with platform was installed 42 m from the new building. Soon after, a pair of ospreys was observed nearby and one of the birds was seen rearranging nest material. However, nothing came of this bout of activity and the site remained unoccupied throughout the remainder of that summer and for the next two years. In the spring of 1983 however, ospreys returned to the residential site and bird guides appeared in the hands of the residents. These ospreys bred successfully and produced four young birds, all of which fledged. To many residents of the home, the presence of ospreys in the backyard was a fascinating event, one that occupied much of their time.

Over the past three breeding seasons, nests on the substitute poles at Indian Path have produced 26 young ospreys at a rate which compares equally to the production of these birds at natural sites. An interpretive sign describing the project was placed close to a nearby high-traffic ferry slip and several stories about these ospreys appeared in newspapers, and company, government and naturalists publications.

As noted at the beginning, installing nest structures for these birds is not new but what made these projects important to us and to others, was the whole-hearted co-operation of many people in both the private and public sectors working together to ensure the continued presence of ospreys in the area. It was a satisfying experience for all of us, as well as an example of practical wildlife management — made easier by the pliable nature of ospreys.

P.J. Austin-Smith

Ontario

Solving the Problems of Wildlife Management In Southern Ontario

Approximately 85 per cent of Ontario's population is concentrated in the south. By the year 2000, this figure will be closer to 90 per cent. Cities, suburbs, industries, intensively cultivated farms, commercial forestry ventures, and cottage and hobby-farm retreats will continue to compete for space on land that once supported a tremendous abundance and diversity of wildlife. Most of this land — all but five per cent — is now privately owned; and that part which remains rural is mainly devoted not to the maintenance of wildlife, but to the making of profits or the securing of privacy.

Yet it is to this land that the people of southern Ontario look, and will look increasingly, for wildlife-based recreation. The problem is obvious: how can wildlife be maintained for public enjoyment in this private land?

Getting in Touch

Ontario's wildlife managers consulted various private organizations and government agencies that deal with private-land interests, and with their help outlined the major issues to be addressed. Stated very simply, these are:

- that incentives of all kinds, from the monetary to the honorary, are needed so that landowners will be motivated to manage for wildlife and to permit access, and so that the public will be motivated to participate in the wildlife management process;
- that communication and co-operation among government agencies, landowners, private-interest groups, and the public in general must improve so that common goals can be identified and met; and,
- that public awareness, appreciation and knowledge of wildlife must increase, and that the skills and standards of conduct shown by users of the resource must improve.

These general issues are closely inter-related, and none can be addressed in isolation. A landowner, for example, is unlikely to manage for wildlife and permit access — even at a profit — so long as he perceives recreationists as sources of liability, or as destructive, unethical, or inconsiderate. The public, in turn, is unlikely to understand the landowner's need to receive a return on his investment in conservation so long as the value of wildlife, and the costs of maintaining it, are not fully appreciated.

These obvious examples illustrate the complexity of the task at hand, and hint at its scope. Basic changes are needed not merely in practice, but also in attitude. Such changes can be made only through a comprehensive, long-term program of action that relies on something much more than governmental dictates. The participation of the entire community of people who care for and benefit from the wildlife resource must be enlisted.

The Business of Wildlife Management

More than 60 per cent of the recreational and economic benefits derived from Ontario's wildlife resource accrue in the south — principally from private land. In 1978, for example, small-game hunting alone was responsible for an output of $60 million for goods and services, and generated $30 million in personal income and 527 man-years of employment; recreation was provided for 144,000 sportsmen. Hunting of all kinds produced $89 million for goods and services, $54 million in income, and 2,072 man-years of employment. Non-consumptive uses of wildlife, meanwhile, generated roughly $120 million for goods and services, $60 million in income, and 2,100 man-years of employment.

Such figures, which represent only those benefits produced *without* the help of the integrated management system proposed here, can be used to motivate more landowners, groups, and individuals to invest in the wildlife resource. An increased general awareness of the value of wildlife to society will help to build greater public support for the concept that must form the basis for future conservation endeavours — that of the landowner as wildlife manager and entrepreneur.

A few landowners will not require financial reward for their habitat work, and will be satisfied with token acknowledgement — certificates, commemorative signage, gifts, letters of appreciation from the Premier, or recognition from their peers. Around this group

could grow a kind of Acres for Wildlife program (Hectares for Habitat), in which public volunteers could solicit landowner participation in habitat programs, or in setting up demonstration or education areas on private land. A Ministry of Natural Resources Conservation Award could be created to honour the outstanding participant each year.

For most landowners, however, financial incentives are a must. Wildlife must compete economically with other cash crops, and be seen as a business base: users must be ready to pay for access. Though this transition may require initial government involvement and actions such as legislative changes, it is on the private sector that business must finally depend. Emphasis must shift from the government-landowner relationship to the private-sector-landowner relationship.

Small businesses, for example, can begin to work with landowners to plan and manage habitat. These firms might be arms of landscape-architecture enterprises; or, they might be consultant firms such as those found in Texas, which deal exclusively with profit-making wildlife concerns. Game-hunting preserves, and other special areas devoted to commercial wildlife harvest or to commercial but non-consumptive activities like group tours, can be set up and run either on a leasing basis, or in co-operation with the landowner. Local companies not directly concerned with wildlife-related enterprises can undertake similar endeavours on a smaller scale, and in return for their investment receive a share of profits, rights of access for employees, or simply a heightened public image. In some cases, grants might be made available to such small businesses to induce initial involvement. To attract the landowner's interest, companies might offer some of the incentives now made available mainly by government-cost-sharing, management planning, or the provision of free or inexpensive materials and labour. Where companies cannot invest directly in such ventures, employees can organize to form volunteer groups that provide incentives such as free labour in return for recreational opportunities.

Volunteerism

Non-profit organizations, similarly, can carry out work for which the landowner lacks time, in exchange for access or other rewards. Rod-and-gun clubs, naturalists' clubs, 4-H clubs, scout and guide troops and the like can organize themselves into efficient wildlife-volunteer brigades, perhaps working on a project-by-project basis. In lieu of habitat work, or of simple 'fee-for-access', such groups could offer other incentives — either traditional ones now seldom used, including help with seasonal farm work or a share of the game bag — or such more innovative inducements as free membership in a local club, removal of nuisance animals, payment of liability insurance, or legal agreements that protect all parties. They can also encourage the landowner to admit others to his property by showing impeccable behaviour themselves, educating others about appropriate conduct, and helping to enforce the game laws.

For members of the non-landowning public who wish to make a direct financial contribution to wildlife management, privately or publicly administered funds may be set up: or, people might request that some part of their tax rebates go to habitat work. In return for such contributions, donors might receive crests, wildlife stamps, or other tokens that would both reward participation and serve as a form of advertising.

In addition to encouraging the use of incentives by the private sector, wildlife managers should examine the conservation-related programs on structures now in existence to determine how these might be used to stimulate landowner participation in the wildlife-management process.

Using Existing Legislation

The scope of the Ontario Heritage Act, for example, might be enlarged so that not only unique natural-heritage lands, but also important wildlife habitat, might be protected. Under this Act, a landowner may donate portions of his land by means of conservation easements made over a number of years, receiving in return the income-tax benefits of

charitable donations. Similarly, the Managed Forest Tax Reduction Program allows landowners to manage for wildlife habitat as well as for timber and other wood products.

In Ontario the Woodlands Improvement Act, together with the Forestry Act, offers other opportunities for inter-agency co-operation. The programs carried out under these Acts permit the Ministry to enter into binding agreements with the owners of lands suitable for forestry, and provide for the planting of trees and the making of other improvements at Ministry expense. Habitat work like fencing, shrub planting and the erection of signage may be carried out through agreements made under the authority of the Game and Fish Act.

Increasing Interagency Cooperation

To ensure proper habitat management on lands not held by private individuals, wildlife managers should inject their recommendations into the programs and plans of such organizations as Ontario Hydro, the Ministry of Transportation and Communications (MTC), licensed forest companies, county and municipal governments (the latter, which controls zoning, can have a great impact on the habitat), and federal government departments. Because such agencies have direct control over large tracts of land, co-operation between them and the wildlife agency is essential. Special co-operative habitat projects could be set up, featuring, for example, multiple-use or integrated resource-management demonstration areas, including wildlife habitat and recreational facilities; and, effective corridor-vegetation management on a variety of available lands.

Just as co-operation is needed to ensure conservation of the wildlife resource on private lands and to provide for access, greater communication and co-operation are also required between those responsible for wildlife and the various agencies responsible for education. The knowledge, behaviour, skills and attitudes shown by those who use the wildlife resource, and by those who maintain it, must be improved.

Educating People — Our Greatest Challenge

Landowners, for example, may require workshops or seminars that teach them how to manage their lands for wildlife. Other specialized educational needs of interest and user groups should also be addressed and, as with habitat management, the help of the private sector should be enlisted to this end. Such educational programs would protect not only the wildlife resource, but also the interests of the groups involved — and the investment of the individual or corporate landowner. One of the many techniques that might be used to further this cause is the organization of interpretive tours of such areas as Provincial Parks, Conservation Authority Areas, Provincial Wildlife Areas, Ducks Unlimited (Canada) agreement lands, Woodlot Improvement Act agreement lands, federally owned property, and large tracts of corporation-owned lands. Such areas could become drawing cards for the tourist industry. They would also be useful for other types of on-site training, such as hunter safety instruction and trapline management courses.

The wildlife agency must also work constantly to improve and update the skills and knowledge of its own staff members, particularly on matters related to private-land management and public-education programs. Similar training for other government employees whose programs happen to affect wildlife should be provided.

Most important, however, is the education of the young people who will make tomorrow's decisions about wildlife and about environmental matters. It is most desirable to reach people before their thought and behavioural patterns are set, and while they are most receptive to skills training — and this can best be done through the elementary school system.

Interesting young people in the subject of wildlife and its management is not difficult, for animals are always one of the primary attractions for children. It is well documented, however that the poor training teachers receive in wildlife subjects, and the personal biases teachers may have, can perpetuate

misconceptions about the resource. The shortage of balanced curriculum material on the subject contributes to the problem. For these reasons, wildlife managers must not only feed information into the school curricula, but must also teach the teachers about wildlife. Materials and kits are now being developed for this purpose.

An important focal point for wildlife education is National Wildlife Week, to which Ontario is increasing its commitment. Steps should be taken by all of the provincial and territorial wildlife agencies to enlarge their contributions to this annual event, and to take advantage of any such opportunities to inject balanced information into the school system. And, ultimately, the private sector should also involve itself in the educational aspect of conservation, organizing hands-on presentations to classrooms, day tours of interpretive areas and other managed properties, presentations to teachers during professional-development events, special publications, and the like.

In addition to making use of educational institutions to inform people about wildlife-related matters, the wildlife agency must also exploit every opportunity to open direct channels of communication with all segments of the public. Since communication is by definition a two-way process, this means not merely dispensing information to the public, but also setting up more efficient means of receiving feedback from the public.

The delivering of information can take many forms, from brochures, displays, films, video presentations and slide shows to advertisements and public-service messages presented through the most suitable media. However it is delivered, the information must be tailored specifically to its target audience. An educational kit for children, for example, might make use of cartoons or other attention-catching graphics, and of very different language than would be employed in, say, a handbook for amateur naturalists. But what is most important, no matter who the intended audience, is that the message conveyed be clear, concise, and — above all — convincing. Information couched in unnecessarily technical language or in 'trade jargon' that may seem meaningless or insincere serves only to alienate the public whom it seeks to attract. A sense of community responsibility for the wildlife resource can be fostered only by the simple, direct approach.

This means that the wildlife agency must learn more about communication, about the levels of understanding to be expected from any segment of the public, about prevailing public attitudes toward and perceptions of wildlife, and about what it is that people want and need from the resource. This work involves research that may take the form of public surveys such as are increasingly conducted by wildlife agencies in the United States, and, equally important, a greater reliance on the information and help that can be provided by the various groups that make up the private sector.

By cultivating a more co-operative relationship with these groups, wildlife managers would also provide more effective encouragement for public participation in the making of decisions affecting wildlife, and in achieving the objectives of wildlife management. At first glance, the setting up of programs that allow for such large-scale participation may seem a complex task. Programs that rely on public co-operation, such as one that encourages citizens to report violations of the wildlife laws, demand that a complicated system of advertising, rewards, and law enforcement be set up. Once in place, however, such a system would secure the loyalties of all by involving them in direct responsibility for the protection of the wildlife resource and, because of this, would become self-perpetuating. That the results would also include a saving of time and money is an added benefit.

It is clear, then, that the future of wildlife management in Ontario — and particularly in the province's south — must rely on programs such as those detailed above. These programs call for the full participation of the public, or "community involvement with wildlife management." The phrase "community involvement" embraces all aspects of the task of stimulating attitudes of public responsibility for the wildlife

resource, from the encouragement of landowner entrepreneurship and hands-on habitat-improvement projects, to information-sharing and the educational programs the wildlife agency itself provides. Only by involving citizens directly with this portion of their natural legacy can we ensure that wildlife is present in abundance — and accessible to all.

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Ontario

Wildlife Management or Wildlife Production?

Abstract

Wildlife offers many benefits. Many wildlife species are decreasing in Ontario. Access to wildlife is decreasing in the southern part of the province because nearly all land is privately owned and the number of city-dwelling absentee landowners is increasing. Hunting and viewing opportunities there could be increased by the recognition of the role that land, much of it a privately owned domain, plays in producing game. Hunters do not pay enough now for their sport by the purchase of a licence to cause an increase in wildlife numbers. Non-extractive users do not even make such direct contributions. Financial incentives to landowners could provide opportunities where none exist now, at a range of quality and at a range of costs to users who should be able to choose the quality of recreation they are able and willing to afford.

Introduction

Wildlife has many values to many people, emotional, cultural, spiritual, recreational, and economic. An abundance of wildlife is desired by many Canadians. Yet there are few if any incentives for the private sector, other than personal motives, to cause wildlife abundance. There are strong incentives for many landowners to diminish or remove wildlife habitat, and thus to diminish or remove wildlife. Attempts to persuade landowners to improve conditions for wildlife or to provide public access to private land and to the wildlife on it, usually include the condition that the landowner do this for free. He is thus asked to act against his own self-interest. This is entrenched in law in those jurisdictions where a landowner cannot legally derive a direct monetary return from the wildlife on his land.

The Importance of Wildlife

Although hunting is only one use of wildlife, it is important because 1) a large number of Canadians hunt; 2) the economic activity that hunting generates is significant and locally very important in many parts of the country; 3) the licensing system under which it operates allows some monitoring of the users and of animal populations and may suggest management decisions to assure their continued abundance; and 4) the licensing system generates funds that, indirectly support necessary management measures for the benefits of all Canadians.

Hunting is also seen by some as undesirable and unworthy of modern man. It may well become more controversial: There is a growing sentiment that the recreational killing of wild animals is never acceptable, not even as a managed annual crop. This is in contrast with the wide acceptance of the commercial killing of domestic animals as a managed crop. Hunting could still become relatively more important, however, because of its economic benefits, and because it promotes tourism, which brings foreign currency to Canada, and helps keep Canadian currency in the country.

The economic importance of wildlife through its non-extractive uses is difficult to estimate because of the absence of a licensing system. A recent estimate for Ontario (Econometric Research Limited, 1982), deliberately conservative because of this difficulty, places its economic impact at half that of hunting. More precise methods, if they can be devised, may well place it much higher.

Wildlife-related tourism enterprises tend to be rural or remote, and in the hands of small businesses. Hence the economic impact from hunting and related activities is very significant locally. By a conservative estimate, wildlife-related spending produced some 14,000 jobs in Ontario alone in 1979, in all sectors of the economy.

The Nature of the Resource

The traditional view of wildlife by wildlife managers is that of a natural and self-renewable resource from which man can take regularly and in perpetuity under systems of wise use. A more recent view is that the wildlife resource consists of species as an abstraction, while discrete populations of a species or a group of species of that resource can be managed as crops, having the components of standing crop and annual yield. The basic resource that supports that crop and produces that yield is the land. Land and habitat in combination produce periodic yields of

wildlife. Man's presence, abundance, activities, and management are in large measure responsible for the present quantity and qualities of that habitat, both favourable and unfavourable. Wildlife management aimed at producing wildlife must therefore, in many instances, include manipulation of the vegetation.

The public finds ever greater scarcities of wildlife, and finds ever fewer places supporting the wildlife of their interest. Management of land and of the habitat that it supports, can maintain wildlife at a desirable degree of abundance. It can increase it. Or it can eliminate it. The ecological changes on the land, caused by man's encroachment may be offset to a great extent by adapting the use of land; by taking measures designed to produce suitable habitat for wildlife. It is increasingly necessary to adopt the view that land is the resource, and that it and its habitat produce wildlife.

The Use of the Resource

The activities of viewing and hunting are uses of land and in the broadest meaning of these terms they may include land management measures carried out by the users, designed to produce abundant wildlife. There are variants on this theme. For instance, land may produce wildlife in the sense of giving rise to new individuals such as the breeding grounds of geese do in the far north, far from the land that sustains them during migration on staging and wintering grounds. All these three categories of land play their roles in producing this wildlife, but its use is concentrated on the migration routes.

Other wildlife may be more nearly sedentary, but on a variety of scales; e.g. cottontails on small home ranges, and white-tails on large ones. Users could play a role in producing wildlife, depending on the species of their interest. They could cooperate with landowners or they could contribute to the cost of habitat management. Or they could pay a resource rental fee for the use of migratory birds. This idea of work done by users applies to naturalists and hunters alike: Placing nest boxes for bluebirds, kestrels, and wood ducks; and growing browse and breaking water trails for deer.

By law the administration of wildlife affairs and the use of wildlife are publicly controlled. This is so, in Canada, even in those jurisdictions where free-roaming wildlife is not publicly owned; and it is so, whether that wildlife is on publicly or privately owned land. In much of the more densely settled and agricultural portions of Canada most of the land, however, is privately owned. Thus publicly controlled wildlife in such cases is the product of a privately-owned domain.

The concept that land produces harvestable wildlife and that therefore the landowner is the producer of that wildlife has two corollaries: 1) It is the landowner who ultimately decides how the land is to be managed, and therefore what the land is to produce or not to produce. 2) It is the landowner who ultimately decides how the land is to be used and that includes the decision who may have access to it for any purpose: hunting, viewing, photography, or just enjoying the scenery. Accepting this view does not amount to turning everything over to private enterprise as some have suggested. The right to decide the use of land and the right to decide what it is to produce are the landowner's now.

The Nature of the Problem

How one views a problem can influence one's solution profoundly. Wildlife managers have more knowledge now than they did 30 years ago. In these times of severe constraints they try to accomplish more for less. But are they sometimes merely running harder in the same direction? Are they in some cases merely refining what has been done in the past? Aren't they sometimes applying yesterday's solutions to the problems of the day before? Are we viewing the ecological problems of wildlife in the most productive manner?

It is common to view wildlife management as an activity that provides outdoor recreation. This leads to underestimating the economic importance of wildlife, especially since most species of the wildlife itself may not be legally sold. It leads readily to the mere mining of wildlife. It leads us to overlook the production function of resource management.

Abundance and production of that wildlife commonly referred to as game are generally declining in Canada, certainly in Ontario, at the same time that there is more demand for wildlife and at the same time that Government's activities in wildlife management are increasing. Wildlife management, in Canada, generally depends on restrictions and prohibitions. This tends to keep the public uninvolved, and it leads Government into taking actions some of which are more operational than governing. We believe that incentives could lead some of the public to take on the operations of producing wildlife, leaving the government to govern.

An essential requirement to "Let the Public Do It" (D. A. Hagan, *In* "Canadian Wildlife Administration." 1983) is positive government action in the area of governing, with a system of private actions in the area of operations. And the driving force will have to be incentives. Forestry, agriculture, fisheries, and wildlife management systems have several characteristics in common: living things, use of land, and harvest. They can be ordered along a continuum of management intensity. The systems involving animals present such a continuum. One end of it may be represented by the opportunistic taking of caribou by natives, whether the animals are abundant or scarce, and whether numbers are increasing or decreasing. At increasing intensities of management the continuum shows: taking a cow moose under the authority of a tag awarded to a hunter by lot; hunting cottontails in a woodlot where brush piles have been made for rabbit cover, the release of pen-reared pheasants for a day's hunt, a cow-calf

operation; and a feed-lot operation for beef.

Systems that yield a wild crop are often not managed as intensively as they are exploited. This is especially so in connection with wildlife. Exploitation and the administration of a hunt are called management. That applies even to wildlife matters on privately owned agricultural land. The main reason for low levels of management, or for an absence of it, is the fallacy of regarding wildlife as a common property to be cropped by anyone for a small fee payable to the Government without any input by the user. This is akin to mining. It also reduces wildlife to the status of a commons with the disadvantages of that status. Resources owned in common tend to have decreasing yields, and privately owned resources tend to have increasing yields. That has been demonstrated in Europe and in North America, including Canada. Add to that the notion that no one ought to profit from wildlife and you know why no one feels responsible individually, for the welfare of wildlife. The "let-George-do-it" syndrome pressures Government into operations that it cannot afford, and for which it is not suited on private land, while it should be pressured instead into governing.

Hunters do not pay enough now for their sport by the purchase of a hunting licence, to cause an increase in wildlife numbers. Game is not produced on private land without cost and hence it is an economic good. Yet the monetary value of game is artificially kept nil. Poachers are more astute and recognize the economic value of a carcass; therefore there will always be an incentive to poach. Non-hunters could well come to appreciate other people's hunting if they had legal access to wild meat. Their payment for it would be a potential source of management funds, i.e. funds to be used for producing more wildlife.

Is There a Solution?

The more spent on producing game, the more needs to be recovered. Hunters spend large sums of money on dogs, ammunition and equipment, and on lodging and travel. It is naive to think, as many do, that the landowner alone should not expect a return for his contribution to hunting.

If the land pays its way and if wildlife earns its keep, then the landowner is satisfied with his returns, wildlife users have the abundance they seek, and Government has done its job.

Financial incentives to landowners could provide hunting opportunities where none exist now, and at a range of quality and at a range of costs to hunters who should have the option to select the quality of hunting they are able and willing to afford.

The current trend of decreasing wildlife can easily culminate in the virtual disappearance of wildlife, from land owned privately in small holdings; at least to the extent that hunting is no longer worthwhile. This trend can be reversed, but not as long as Government sees an operational role for itself on private land. There is no need for Government to stand between the producer and the users of wildlife on the producer's private land. A more suitable role for Government is to encourage private groups in a positive management program so that they will carry out necessary operations and develop systems of compensation themselves.

Conclusion

Local declines in the numbers of certain wildlife species have been occurring for a long time in Canada. These declines will probably continue under the present systems of wildlife management for we are asking the public to act against its own self-interest: producers to produce more wildlife and users to use less. For Governments to reverse the declining trend in animal numbers, operationally, would be costly. A system of payments by users to producers and to providers in money, in labour, or in kind, in exchange for the use of land and of wildlife would not cost the taxpayers money, but it would satisfy the landowner, the user, and the general public as well as the Government, by producing abundant wildlife.

Times have changed, and conditions are ever changing. Instead of running harder in the same direction, we would do well to try taking a step or two in this different direction which has been developing for years. As systems

change, traditions will change, and users will change. The conservative element will allow at most a gradual change. A change in landowner's outlook on the use of land by the public for any purpose is unlikely to be universal among rural landowners. This will always allow choices for landowners and wildlife users alike. Crown land in Ontario is extensive, so that the free enjoyment of wildlife will always be available. It may be of a lesser quality in some ways than wildlife use for payment on private or leased lands, but of a higher quality in other ways. Change is inevitable. Let us change also so that we can continue having what we cherish, abundant wildlife.

L.J. Post

Ontario

The New Private Lands Trapping Program

The history of the fur trade in North America is well documented (H. Innes, 1956. The Fur Trade in Canada. University of Toronto Press). Initially, sparse native populations and primitive weapons ensured a reasonable balance between people and wildlife. The arrival of the Europeans with their "magic" tools resulted in a lengthy period of political, economic and social instability for the Indians, and declines of furbearers and game animals — a trend not reversed until well into the 20th century.

The most significant development in the management of furbearing animals in Ontario was the Kelly Evans report of 1911. This remarkable report eventually led to the licensing of trappers and fur dealers, the sealing of pelts, the assigning of quotas, and the charging of royalties. Although all of these management measures were and remain useful, it was not until the registered trapline system was implemented in the late 1940's that trappers began co-operating with one another and with the Ministry, poaching was greatly reduced, and furbearers began to increase — in fact, beaver continued to decline even after Evans' recommendations took effect (Fig. 1).

Some 90 per cent of Ontario is Crown Land. This land is divided into about 3,000 registered traplines. The management of furbearers on Crown Land has continued to progress; but it became apparent by the mid-1970s that administrative improvements in fur management were required on the 10 per cent of lands in private ownership if progress were to be made there.

Human growth in Ontario (Fig. 2), continuing expansion of city populations — both permanent, (retirement homes, suburbs) and transient (cottagers and absentee landowners) — increased contact with trappers and nuisance animals: beavers flooding roads (Fig. 3), raccoons invading attics, and more pets being caught in leg-hold traps. Much of the city-raised population is opposed to trapping almost solely because of the leg-hold, and generally reacts negatively upon first contact with a trapper. Most city people love wildlife — until they have a bad experience with it. Then they want the animals destroyed immediately, not realizing until then that the trapper has been a quiet, effective community asset.

As urban populations grew in recent years, the number of resident and farmer trappers continued to increase dramatically (Fig. 4). This

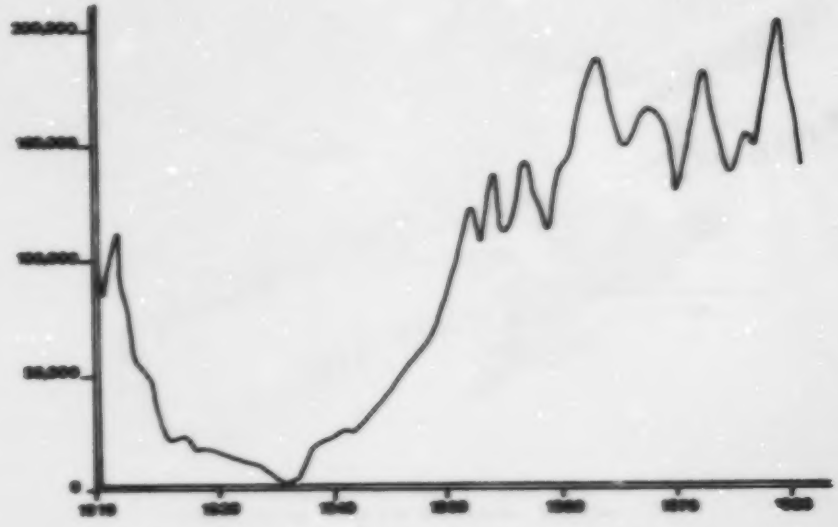


Fig. 1. Harvests of beaver in Ontario.

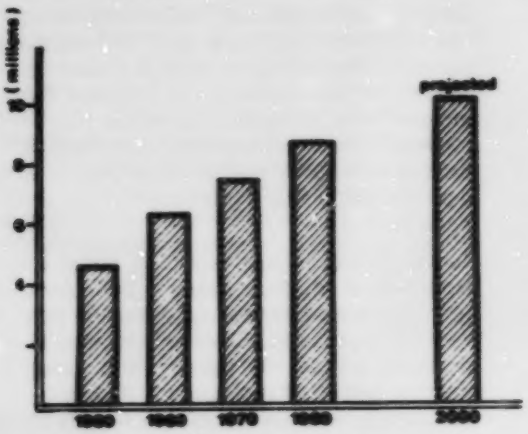


Fig. 2. Number of people in Ontario. (Statistics Canada)

caused unnecessary and at times severe competition reminiscent of the conditions on Crown Lands prior to 1950, when competitive harvesting spelled poor wildlife conservation (Fig. 5). Between 1970 and 1980, the total number of trappers increased from 9,503 to 17,858. This increase was made up largely by those trapping on private lands.

The problems were compounded when the Ontario government said that, by 1980, all new trappers would have to take the Fur Harvest, Fur Management and Conservation Course. Many trappers felt that this would increase well-trained competition in a system that was already over-crowded. On the other hand, there remained districts with too few trappers to manage furbearers properly — a situation that led some townships to pass ineffective

Fig. 3. Beaver ponds are a major problem in Ontario.

beaver-bounty laws to cope with all the nuisance animal cases. However, direct application of the registered trapline system to private lands was not feasible because the landowner controls treepass rights. An attempt at a solution was the Private Lands Trapping Program which was developed with the following basic guiding principles:

1) unrestricted trapping leads to poor furbearer husbandry and poor landowner relations;
2) the Ministry will promote the creation of small, discrete trapping areas on private lands to satisfy the biological needs necessary to manage the furbearers;
3) every effort will be made to develop and manage these areas co-operatively and in

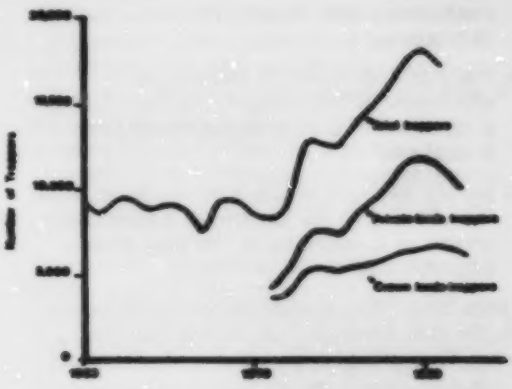


Fig. 4. Number of trappers in Ontario [illegible] activity in the vicinity of the implementation of the Fur Harvest, Fur Management, and Conservation Charter and possibly reduced [illegible] for pelts.

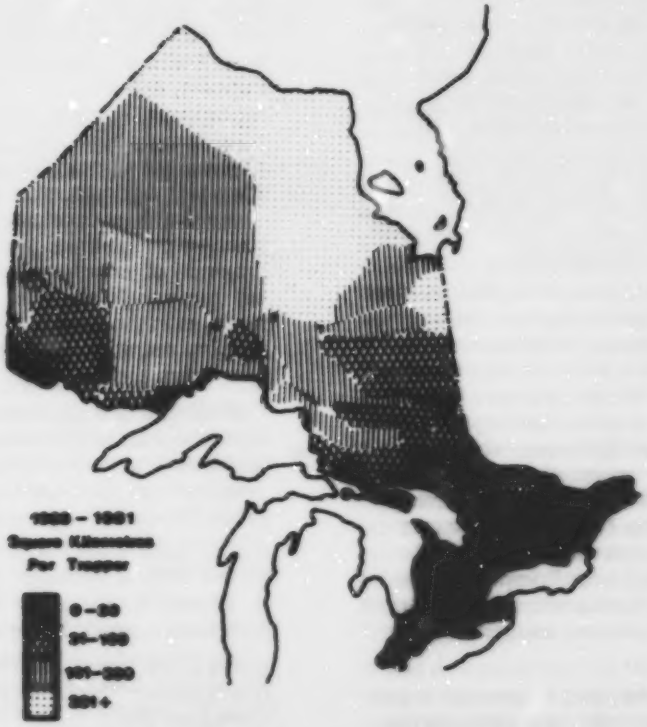


Fig. 5. Trapper densities in Ontario. Many local areas within the darkened section of the map had densities averaging 1 trapper for 4 to 10 km^2.

consultation with existing trappers' councils or groups;

4) many problems can be reduced or eliminated by encouraging trappers to trap in specific Private Lands Fur Management Areas; and

5) several trappers will be licensed for an area in order to give the landowner a reasonable choice as to whom he or she may allow to trap on the land.

There have been at least two local precedents for the idea envisaged under this new program. One group, known as the Marlborough Trappers Council (within commuting distance of Ottawa), managed to obtain access for trapping to over 83 per cent of local private land even though many of these areas were owned by absentee landlords and city dwellers. This was achieved through co-operation between the trappers' council and the Ministry. Another group, known as the Minesing Swamp Trappers Council, helps select new trappers, and settles territorial disputes and other serious problems. The Minesing trappers voluntarily curtail their trapping activity when the muskrat pelts become scarred from fighting, even if the spring season is still open, and when the local muskrat population becomes low.

The Private Lands Trapping Program does not mean that the trapper will trap less than in the past. In Ontario, a trapper may trap only on private lands for which he or she has obtained written permission. Ministry policy is that the lands actually signed up and managed by individual trappers should be expanded if possible, but that this expansion should be consolidated within a specified location. Interestingly, a local program in the Thunder Bay District once assigned only one trapper to an area similar to the Private Lands Trapping Areas. According to those familiar with the program, it worked and the landowners supported it heartily.

The program took two years to develop. It was approved in January, 1981 by the late James A.C. Auld, then Minister of Natural Resources. Because of the broad nature of the program, final implementation was set for 1984-85. The Ontario Trappers Association worked with the Ministry on the program from the beginning and has been very supportive.

Thus, Private Lands Fur Management Areas will be small management units in which harvest levels and numbers of trappers are to be controlled by the Ministry in close co-operation with the trappers' councils, and in which the landowner's needs are stressed. Factors to consider in the formation of these areas are rural and urban human population densities, nuisance animal problems, disease problems (primarily rabies and tularemia), furbearer abundance and the types of species (for example, in productive marshes, the abundant muskrat can support more trappers than the relatively less abundant fox populations can on the uplands), and special circumstances such as semi-urban trapping.

The districts are responsible for drawing the boundaries of the Private Lands Fur Management Areas in close consultation with the trappers, and for submitting the maps for registration. The size of the areas will vary considerably depending primarily on the physiography (rocky terrain vs. muskrat marshes), agricultural practices, the capacity of the land to support wildlife, the types of trappers on the area, and in some cases the proximity of large towns and cities. The areas will thus vary in size from a few hundred hectares, as in the case of highly productive muskrat marshes, up to six townships where furbearers are few.

The number of trappers on an area will range from about 20 to 80 or more. All trappers active before the implementation of this program may continue to use all private properties previously trapped, including any that lie outside the home fur management area of their choice. However, all new trappers will be allowed to sign up private properties only within one specific home area.

Some of the functions of the Private Lands Fur Management Trapping Groups which are envisaged are:

1) to provide a direct and very localized input to the district trappers' council;

2) to assist the Ministry in managing furbearers;

3) to assist in the control of nuisance and diseased animals;

4) to work with individual landowners, explaining what a trapper can do to manage the furbearers on their land (Fig. 6);

5) to encourage unit members to become more involved in proper fur management;

6) to assist the Ministry in its enforcement work;

7) to engage in management work such as habitat improvement for muskrats and ducks;

8) to assist the Ministry in selecting and helping new trappers become established;

9) in the future, to play a key role in apprenticing and educating novice trappers; and

10)to educate the public.

Within a Fur Management Area, no controls will be exercised over the number of farmer and landowner trappers trapping solely on their own properties. The status of registered trappers whose traplines fall within a Private Lands Fur Management Area will not change. It is the number of resident trappers that will be carefully controlled. In its final plan for a Private Lands Fur Management Area, each district will calculate, based on the best available data, the allowable fur harvest, and try to match this with the optimum number of trappers to achieve the desired harvest. In some areas, this may mean that the number of trappers is reduced. In other areas, the number will be increased due to under-harvesting at present. It will probably take several years to find the correct balance between trappers and furbearer abundance.

We believe that, in time, trappers will begin to co-operate in managing the furbearers and their habitats, and in dealing with landowners and the public in general. At present, because of intense competition in some areas, trappers often find themselves in conflict with each other.

We believe that the ideal Private Lands Fur Management Area should have between 15 and 40 trappers. This would give a landowner a choice of trappers, and still allow trappers to act as a cohesive group. As of this writing, it appears that some districts are projecting units with 80 to 120 trappers. It remains to be seen whether or not such groups can act co-operatively.

An existing trapper may choose the area in which he would like to trap. But once the choice is made, he is to confine his activities to that area unless he previously trapped outside the area. This will not prove too limiting. Field surveys, by Ron Campbell, Wildlife Management Officer in the North Bay district, indicate that even with relatively small areas only about 10 to 15 per cent of the existing trappers would trap outside of the proposed area. Most trappers therefore trap within a small "home territory." Few of them maintain extensive traplines on private lands which are impractical, time-consuming, and expensive because of high travel costs. Productive trappers would rather be tending traps than driving cars. In addition to these drawbacks, long traplines often lead trappers into conflict with the local, resident trappers. For example, one farming township in southern Ontario closed all township-owned lands to trapping because of the activities of one, overly aggressive trapper whose trapline was too extensive. A further disadvantage of the long trapline is the need to inspect all live-holding traps, every 24 hours as specified in the Trappers' Code of Conduct. Trappers who have a long trapline are likely to be seen as greedy, inhumane and irresponsible, interested only in taking the cream of the crop. It is doubtful that the public, landowners and local trappers will stand for such behaviour in the future. Many trappers have already indicated this by their favourable response to the proposed Private Lands Trapping Program.

In this new program, the Ministry has given trappers an opportunity to better their working conditions and assume more responsibilities in managing furbearers. Clearly this is a broad, long-term program with certain benefits and

problems, requiring some change on the part of the trappers, the Ministry, the public and the landowner. The question, "Is it going to work?" is frequently asked. The answer is, "We will have to wait and see." Changes in trappers' behaviour, and in the attitudes shown by the public and by private landowners, will take time — perhaps 5 to 10 years. But the results should be worthwhile.

Milan Novak
Furbearer Management Coordinator

Fig.6. In the end it will be the behaviour and attitude of each individual trapper that will determine, to a great extent, how much trapping takes place by the year 2000.

Quebec

Controlled Exploitation Zones

— An Approach to Wildlife Management Planning

Introduction

In 1977, the government of Québec introduced a new wildlife resources management system that led to the creation of controlled exploitation zones (1). After a brief reminder of the evolution of the system and the impact it had on public accessibility to wildlife within a large area of Québec, we believed it would be useful to describe more specifically the main steps that led to citizen involvement and to their participation in the process of wildlife management planning.

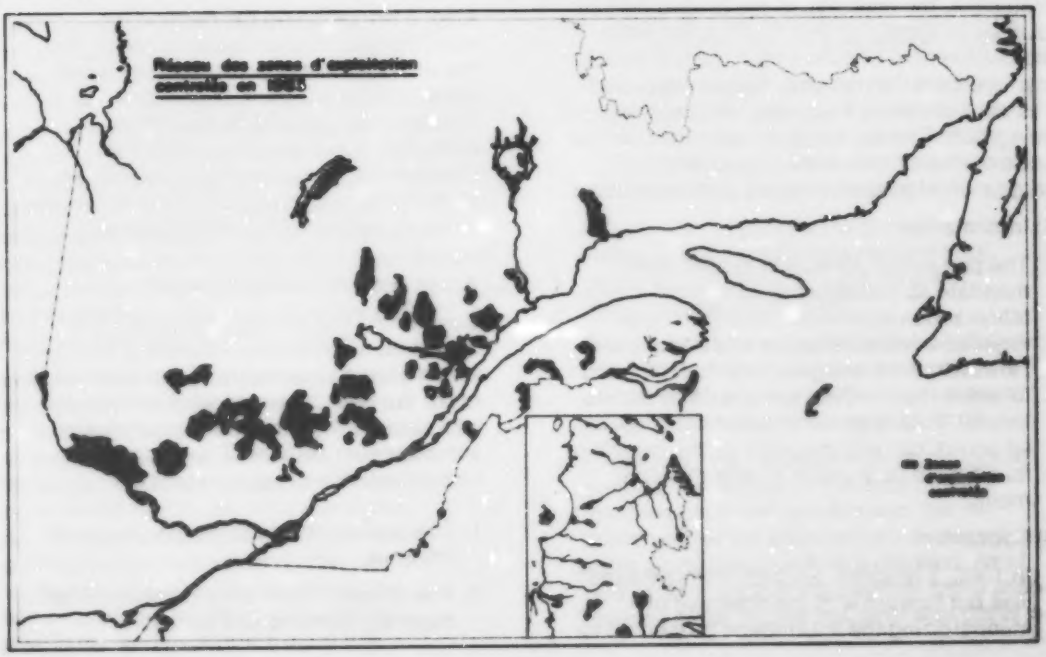
Setting up the system

As reported by Cinq-Mars (1979) (2), at the end of 1977, the government of Québec decided not to renew leases for exclusive hunting and fishing rights of nearly 1,200 private clubs. The new proposed system led to the creation of fifty-five controlled exploitation zones covering, as early as the summer of 1978, an area of more than 37,000 km².

In 1980, this principle of wildlife management delegation was extended to salmon rivers which had been excluded from the operation in 1977. In recognition of several citizen groups, the department in some cases supported the creation of management societies. These may regroup representatives of sport-fishermen, private property owners, native people engaged in subsistence fishing, outfitters, or any other citizen groups. Actually, this system includes 66 controlled exploitation zones, covering an area of 41,500 km² including 523 km of salmon rivers. More than 425 supplementary kilometers of river should be integrated within a short time.

Impacts on accessibility to wildlife

Because little information on the utilization of territory by private hunting and fishing clubs was available, it is risky to compare with the present data on the frequentation of controlled exploitation zones. At the most, we can ascertain an increase in frequentation. However, it is possible to compare the frequentation in the controlled exploitation zones, with the one of other systems visited by fishermen, hunters and trappers. As shown in Table 1, in 1980, the controlled exploitation



zones provided twice as many recreation days as in the outfitting areas with exclusive rights and four times as many as in wildlife reserves.

Table 1
Numbers of hunting, fishing and trapping days/km² depending on the type of area in 1980 (3).

TABLE 1

Type of area	no. of days: hunting, fishing and trapping	surface area	days/km²
wildlife reserves	1 027 401	108 000	9.5
outfitting areas with exclusive rights	212 272	12 387	17.2
controlled exploitation zones	1 377 425	41 573	33.1

Citizen involvement: a realistic objective

In addition to rendering wildlife resources more accessible and assuring an adequate protection, the objective of the government of Québec in setting up this new system, was the involvement of concerned users in wildlife management. To this end, the strategy used has been a classical approach to management delegation. The approach is based on the four basic elements: information, education, adaptation of available means and evaluation.

A) Information

The pertinent information to fulfill their mandate as managers of controlled exploitation zones is provided mostly through regional wildlife biologists and technicians. However, the managers soon felt the need to widen their knowledge of wildlife and its habitat. As a result, the department has set up an educational program for the benefit of its different partners in wildlife management.

B) Education

In 1980, a program entitled "Forma-Faune" was put forward with the objective of standardizing the information passed on to the different managers and providing them with the essential elements for the realization of an adequate wildlife management plan for their respective controlled exploitation zone.

N.B.: The realization of these plans is part of an overall approach taken by the department, who, based on a strategic plan, produced a first generation of management plans for management and conservation zones. Individual species management plans will eventually complete the program.

In this context, two intensive workshops of two days are organized during which lectures, film projections and discussions are held. The workshops are held during the winter. They are addressed mostly to association representatives directly involved in the management of controlled exploitation zones. Participants are instructed on the ecology of wildlife species, the everyday applications of major biological principles, the consequences of habitat destruction, etc. . .

Also, a workshop on the method for realizing wildlife management plans, and the development of protection strategies complete the program. Instructors are chosen amongst wildlife biologists, technicians and wardens within the department. These sessions provide an exceptional opportunity for all to exchange ideas on subjects of common interest.

C) Adaptation of available means

Concerning the management plan, the department developed a planning approach which allowed managers of associations to make the best decisions when confronted with choices in wildlife conservation and enhancement matters. This approach is comprised of five major stages:

1. The realization of the wildlife image of the area;
2. The division of the area based on wildlife supplies, demand and access;

3. The analysis of problems for each patch and the identification of possible solutions;
4. The choice of solutions in accordance with the association's guidelines, the users' expectations and the budgetary situation;
5. The acceptance of the plan by the regional authorities of the department.

All these stages are explained in a guide book entitled: "Méthode d'élaboration des plans de gestion de la faune dans les zecs" (4); prepared specifically for the associations.

The realization of the first three stages allows the associations to identify the necessary elements in choosing solutions in order to manage wildlife for the next three years.

Finally, the acceptance by the department ensures that the proposed objectives and solutions, meet the department's main objectives and are in accordance with the signed protocols of agreement.

There are great advantages to such a planning approach. Firstly, it forces the associations to be aware of the wildlife components characteristic of its controlled exploitation zone, no longer uniquely from the point of view of a sportsman or a user, but from the view point of a manager. This often results in these people questioning themselves on their perception of problems and on the solution that they should use. It also allows for the production of a document that has a different duration from the term for which the administrators are elected.

Therefore, if an important change occurs within the administration board, the planning document remains an analytical guide that can certainly be modified but, because of its basis, remains a guideline for diverse actions advocated by the new managers. From its management plan, the association is then asked to prepare, annually, one or more operating plans. These plans are made by bringing together, in a chronological order and depending upon the available budget, the different solutions that have been developed in the management plan and to which a time-schedule is given (The realization of these plans should require the association to constantly update its management plan in order to keep intact the triennal program).

The annual operating plans also help justify demands through an annual subsidies program ($600,000) allotted for habitat improvement (and not for operating costs).

D) Evaluation

Several clauses of the five-year protocol of agreement permit an evaluation of the smoothness and efficiency of the controlled exploitation zones system.

Among these clauses, there are the obligations of the association to:

- Realize a wildlife management plan;
- Produce an annual action plan pertaining to wildlife exploitation, protection and management in the controlled exploitation zone;
- Adopt, at a general meeting, users fees for different wildlife recreations activities;
- Produce annual activity reports, giving precise information on the levels of land utilization, the financial status and the utilization of subsidies obtained through the habitat improvement program.

As yet, it is not possible to give an overall evaluation of the system's performance. However, the department is aware of certain trends and results.

The value of management plans produced in 1982 and 1983 has been verified by the department's regional authorities taking as reference the methodology guide book.

Eventually, the pertinence of the proposed method, the degree of the association's involvement in the process and the improvement of the association's management performance will be evaluated. As of now, it appears that the use that some associations make of their management plans is

proportional to their involvement in the elaboration of the plan. The "Forma-Faune" sessions in the future will aim, among other objectives, at evaluating the manager's aptitude to use this tool.

As far as the control of users is concerned, more than 900 persons have been designated as auxiliary wildlife conservation officers by the associations. Using the evaluation system of the department for its wardens, it has been established that the task accomplished by the auxiliaries, on a percentage basis, gives equivalent results to those of the regular employees as far as the control of harvest quotas and seasons are concerned.

As to the control of wildlife harvesting, all the mandatory associations have set up data systems sensitive enough to detect over-exploitation and therefore enable the closing of activities in threatened areas.

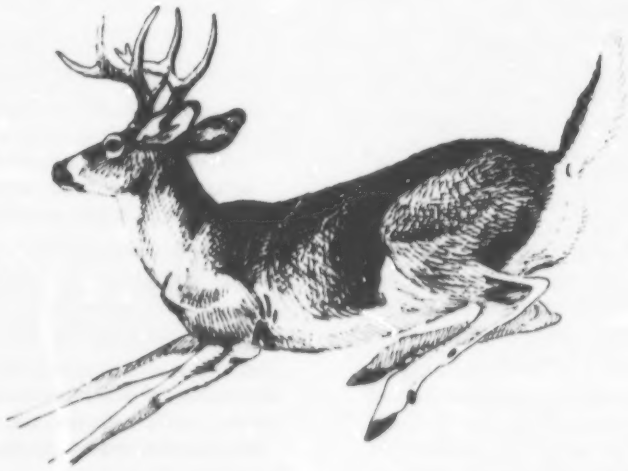
Finally, as to fees applicable in controlled exploitation zones, the competition is not high, although the potential exists. In general, prices adjust themselves to the operational context.

Conclusion

Despite the obstacles that came up, the controlled exploitation zones system appears to have achieved the anticipated degree of autonomy in a very short period of time. To attain this objective, financial autonomy of operations and the realization of wildlife management plans have been, as agreed to by the associations, the two major measures retained by the department in 1982.

A more in-depth evaluation remains to be done. But the recent advent of a federation representing the associations is a new indication of their willingness to pursue their involvement on the wildlife management that has been delegated to them.

Luc Samson
Gaetan Hamel



(1) Commonly called ZEC or zec (Zone d'exploitation contrôlée)
(2) Cinq-Mars, J., 1979. Controlled Exploitation Zones: A new approach to Wildlife Management. Canadian Wildlife Administration. Vol. 11, No. 4, pp. 33

(3) Pelletier, J., Lacasse, M., Lamontagne, G., Ducharme, J.-L., Aménagement et utilisation de la faune au Québec: répertoire des données. Gouvernement du Québec, Ministère du Loisir, de la Chasse et de la Pêche, Direction de la planification, avril 1981, pp. 243

(4) Gouvernement du Québec, Ministère du Loisir, de la Chasse et de la Pêche, Juin 1982, Méthode d'élaboration des plans de gestion de la faune dans les zecs, pp. 17.

Québec

The Quebec Big Game Data System

In 1971, the "Ministère du Loisir, de la Chasse et de la Pêche" set up a data system on big game mortality, aimed at simplifying the management of big game harvesting. The objectives of the system were to:

- standardize data collection by utilizing a computer card;
- utilize a computer to allow rapid and accurate data compilation;
- define a permanent and accurate localization system that would not be affected by changes in administrative boundaries.

Previous to this period, data were entered on the reverse side of hunting permits. Electoral districts and hunting zones were the geographical entities used for localizing kill sites. Moreover, all compilations were done manually.

The form introduced in 1971 has been modified through the years in order to refine its utilization at all levels of use. It contains biological information on the different big-game species and their predators, as well as administrative information on users (hunting permit, hunter certificate, postal code). All big game species found in the province of Quebec, i.e. moose, white-tailed deer, caribou and black bear, as well as predators, i.e. wolf, coyote and domestic dog are covered by the system.

Data collected include the location of the kill, the hunting zone and the sex and age of the animal. The presence of milk is noted for adult females. Also, when the exact age of the animal has been established, a space is provided for entry.

The system identifies seven possible causes of mortality; legal hunting, poaching, predation, accidents (usually road kills), trapping, control and other causes. The "control" cause was added a few years after the system was set-up in order to identify those animals that were captured either during a predator control program, or because they were causing damage to private property. All animals for which the cause of death cannot be precisely identified are compiled under "others."

The Universal Transverse Mercator System was chosen by the department to localize the sites of dead animals. It was slightly modified to facilitate its use in the field and to allow quick and accurate location of kill sites. The system allows for an easy retrieval of information for a given area, whatever the geographic and administrative entity that identifies it. Therefore, even if the area was included in several hunting zones over the years, it is always possible to obtain a certain continuity in the compilation of data. Moreover it allows the department to adapt, with a minimum of effort, to the other zoning systems used over the whole of Quebec. In order to facilitate compilation, special codes have been chosen for different land-use management areas (controlled exploitation zone, park, wildlife, reserve, outfitting area).

The working structure, which was centralized at the beginning of the program, has been gradually regionalized to facilitate and refine the process of verification and correction of documents. A form allowing for correction after the fact has been devised. The program has been set-up in such a way as to permit effective and rapid modification and correction of any recorded data, whatever the year of entry.

Each registry office possesses the required material to locate the kill sites. Actually, a "Mercator Booklet," including all the maps of the area covered by the office, is at the disposal of the staff in charge of registration. Each regional office also has a master-book

covering the whole province to which personnel in charge of registrations can refer. The booklets have a 21.5 by 35.5 cm. format and contain 1: 250,000 scale maps cut in two and folded in the center. On each map, letter-blocks and 100 km² divisions are indicated. A transparent plastic grid gives the numbering of each square kilometer. For the area north of the 50th parallel, 1: 500,000 scale maps are used and location is within blocks of 100 km².

Finally, the forwarding of record files to the co-ordination unit is accomplished by pre-addressed and post paid envelopes. After the information has been gathered at the registry office, record files are forwarded to regional offices where they are verified and corrected by the staff responsible for the program. The files are then sent to the Quebec office where they are coded, classified and loaded on magnetic disks or tapes for future computerized data processing. A data validation program detects any errors and corrected files are reloaded.

To date, the system stores close to 250,000 documents containing data gathered since 1971, as well as data on restricted hunting in wildlife reserves during previous years.

The big game data system has proven to be an indispensable managerial tool for the department. This system can provide several types of compilation related to big game exploitation because of the many possible numbers of combinations of parameters included on file.

For the management and regulation of harvest activities, the department can count, every year, on overall profiles of all the management units (hunting zones, controlled exploitation zones, wildlife reserves). Moreover, the system has proven to be a useful tool for environmental impact studies or specific research projects in restricted areas. The system also allows wildlife officers to establish more efficient protection plans by accurately identifying areas of intensive use and exploitation. Administrative information (hunting permit, hunter certificate, postal code) allows for obtaining data on hunting habits, hunters origin or frequentation by non-residents.

Marie-Hélène Roy
Robert Joly

Saskatchewan

Saskatchewan Co-Operative Movement in Wildlife Habitat Protection

The continued loss of wildlife habitat in agricultural Saskatchewan has become the major concern for provincial wildlife managers. Some parts of the prairies are totally denuded of native vegetation while most other areas are being converted to agriculture through clearing, breaking and draining at a rate of 5-10% annually.

Wildlife management programs in government and non-government organizations have individually had some limited success in protecting wildlife habitat on some Crown lands and on small parcels of private land. However, it has been virtually impossible to protect and manage large wetland complexes in Saskatchewan.

Large wetland complexes comprised of a mixture of marshes and/or creeks, and uplands produce more wildlife per unit area than any other habitat in Saskatchewan. Yet, where ownership of these lands has been complicated, land use has been diverse or public perception of wildlife in and around these areas has been negative because of waterfowl depredation, none of these very important areas were successfully protected before 1983.

Ponass Lake Wildlife Area

A recent agreement called the Heritage Marsh Program has become one of the most effective means of conserving large wetland complexes in Saskatchewan. The first project to be completed was at Ponass Lake, a 7,400 acre marshy complex of wetlands in east-central Saskatchewan. The lake is a traditional breeding, moulting and staging area for large numbers of waterfowl and has an established reputation among hunters from across the continent. In addition highlands within the basin provide valuable grazing land while thousands of low lying lands are an important source of wild hay in years of normal runoff.

Because the area is very flat, slightly higher than normal runoff resulted in extensive flooding of farm land over the years and various agricultural schemes to drain or provide flood control were entertained. On the other hand Ducks Unlimited developed an interest in developing the area for waterfowl production. The Saskatchewan Wetlands

Ponass Lake Project – a waterfowl bait station – part of the program to prevent waterfowl depredation around the Ponass Project.

Committee consisting of senior officials from Saskatchewan Agriculture, Environment and Parks and Renewable Resources had reviewed many proposals for water management in the Ponass Lake basin but had continually failed to agree on an acceptable approach.

A crucial stumbling block was finding an acceptable solution to the chronic waterfowl depredation problem associated with the marsh. Local farmers were convinced that management of the wetlands to increase ducks would result in higher losses to marauding waterfowl. The Heritage Marsh Agreement was signed only after intensive negotiations between Ducks Unlimited and S.P.R.R. resulting in a commitment for greater involvement in waterfowl depredation by Ducks Unlimited in all of their new projects.

Initial signatories to the Heritage Marsh Agreement were S.P.R.R., Ducks Unlimited, the Saskatchewan Wildlife Federation and the Natural History Society. Each agency and many other individuals were involved in the Ponass Lake Project, the first Heritage Marsh.

Under the agreement the Saskatchewan Government donated Crown land for use in management proposals on selected basins. Ducks Unlimited provided construction costs and purchased lure crop lands and/or constructed bait stations to reduce waterfowl damage around the projects. S.P.R.R. administered the depredation program as part of the provincial crop depredation program. The other signatories contributed financially to the program.

The project was officially dedicated on October 4, 1983 by the Deputy Premier of Saskatchewan, Ducks Unlimited Directors from Canada, U.S.A. and Mexico and a myriad of representatives from private and government agencies who had played a role in the project's development. Perhaps most important for the project's long term viability was the one hundred or so local landowners attending.

The presence of the landowners and the subsequent support and assistance by these people resulted from the successful combination of conservation efforts with protection from wildlife induced conflicts. Signing of the Heritage Marsh Agreement meant that land could be purchased as a buffer against ducks foraging around the bait stations. The depredation prevention program became doubly effective resulting in the landowner's full co-operation in all aspects of the program.

Nicolle Flats Wildlife Interpretive Area

The Qu'Appelle Implementation Agreement provided for federal-provincial cost sharing of a variety of environmental, recreational, fisheries and wildlife conservation projects. The Nicolle Flats area, a recent addition to Buffalo Pound Provincial Park, had for many years been recognized as having unique values for a variety of wildlife species and ecosystems within one hour's drive of the cities of Regina and Moose Jaw. The major value was originally believed to be for production of waterfowl through expansion and development of a small marsh in the Qu'Appelle River flood plain. However, through co-operative planning between Parks Canada, biologists, park planners and interpreters from Saskatchewan Parks and Renewable Resources, Ducks Unlimited and local farmers, the project became Saskatchewan's largest and most diverse wildlife interpretive centre. On any given day the visitor is treated to the opportunity to see and photograph plains bison, white-tailed deer, nesting and feeding great blue and black crowned night herons, feeding white pelicans and double-crested cormorants, beaver, muskrat, western painted turtles, thousands of ducks and geese and song birds.

On August 27, 1983, the Minister of Parks and Renewable Resources, the federal Minister for the Department of Regional Economic Expansion and the President of Ducks Unlimited (Canada), officially opened the interpretive area to the general public. Since that day, the area has seen continuous use of its viewing tower, marsh board walk, nature and hiking trails and observation blinds. This is an area where you actually experience wildlife in its natural environment. The historic Nicolle homestead on the property has been incorporated into the interpretive program to enhance and complete the interpretive

experience. Again the judicious use of waterfowl lure crops and deer feeding stations has resulted in local landowners viewing the project as an asset to their community.

Conservation of Saskatchewan wildlife and its habitat is a long uphill struggle. Too often we hear of efforts to conserve critical habitat failing because of conflicts in objectives or perceived values. The positive results gained by the co-operative programs at Ponass Lake and Nicolle Flats have shown that a variety of interest groups and agencies can successfully work together for mutual gain. All actors have become part of the solution rather than a problem. Without the particular resources and capabilities contributed by each of the co-operating agencies, neither project would have been possible.

Wayne Pepper
Millie Gollop
Rose Malinchuk

Nicolle Flats — wheelchair accessible boardwalk — a vital part of the marsh interpretation and public education program.

A Perspective for Canadian Wildlife Federation Involvement

The Canadian Wildlife Federation has achieved phenomenal growth since its inception in 1961 and particularly over the past decade. With over 500,000 members and affiliates across Canada, drawn from all segments of our society, it is in a position to exert some measure of influence on the direction of government policies. Although CWF has no direct authority or responsibility for wildlife administration, it nevertheless has a deep and abiding interest in government administration policies and the application, or transfer, of management technology.

The primary objectives of CWF relate to the protection, conservation and effective management of Canada's wildlife resources. In pursuing those objectives the Federation was involved in the formulation and articulation of the "Guidelines For Wildlife Policy in Canada," a product of the Federal-Provincial Wildlife Conference. One of the salient features of these policy guidelines is the attention given to land-use and resource extraction activities. This developed out of the recognition that effective wildlife management cannot be achieved in isolation of all of those other resource management activities and policies which impact on wildlife and its habitats.

There are two broad land use activities, in particular, that have major implications for effective wildlife management. These are agriculture and forestry, which together encompass most of the accessible productive land area in the country.

Concern with respect to forestry operations, and their potential impacts on wildlife habitat, both beneficial and degrading, led CWF to co-sponsor the symposium on the "Integration of Forest and Wildlife Management" scheduled to be held in British Columbia in 1984. That symposium will have been concluded by the time this paper is published.

Another initiative taken by CWF is its involvement in co-sponsoring the World Conservation Strategy Conference to be held in Ottawa in June 1986. Initially this was conceived as an international wildlife conference, to be held in conjunction with the National Parks Conference in 1985. However, because of logistical and other problems, discussions were directed towards a broader resource conservation theme, related to the success of implementing the World Conservation Strategy around the world. Other sponsoring agencies will include the International Union for the Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Programme (UNEP), the World Wildlife Fund (International) and Environment Canada, representing the Government of Canada.

Since Canada has formally adopted the Strategy, it is natural that CWF, as the country's largest non-government conservation organization, should also adopt and pursue its implementation. In this respect, CWF will be working with its respective provincial affiliates, governments, and other non-government organizations on plans designed to implement the World Conservation Strategy in the context of each jurisdiction. We have barely scratched the surface in developing a useful and mutually co-operative approach to this process. There is still much work to be done but, given a spirit of mutual accord and an appropriate consultative process, we can perhaps jointly demonstrate Canada's commitment to the World Conservation Strategy by 1986.

CWF thoughts and approach to the consultation process were fairly well detailed in the paper on that subject presented to the 1982 Federal-Provincial Wildlife Conference. As Canada's leading national wildlife conservation organization, CWF endeavours to maintain an on-going dialogue with wildlife administrators at both the federal and provincial level. If CWF is to maintain a reasonable and responsible approach to wildlife issues, this close consultation and free exchange of information is essential. In the long term, we all benefit from a well informed public that is able to support policy initiatives aimed at the well being of wildlife.

Kenneth A. Brynaert
Executive Vice President

Multiple Land Use and Habitat Management

Ever since wildlife managers recognized habitat destruction as the greatest threat facing North America's waterfowl resources, a large accusing finger supplemented by frequent bursts of strong criticism has been pointed at the agricultural industry.

Overlooked in the war of words that inevitably breaks out as charges and countercharges fly between the two factions is the fact most farmers have a strong conservation ethic based on their dependence on the land, their close contact with nature and their choice of a rural rather than urban lifestyle.

But while this conservation awareness may be an integral part of many farmers' philosophies, many are the victims of economic pressures that force them to squeeze maximum returns from the land to survive. As greater emphasis is placed on short-term production efficiency as agriculture's primary goal, thought is seldom given to the long-term effects of this kind of intensive, production-oriented land use.

Like most sectors of our economy, agriculture is faced with a "grow or go" situation. Canadian farmers have been challenged by the Canadian Wheat Board to increase grain exports from 1990's 20 million tonnes to 36 million tonnes by 1990. While some of this additional production will come from more intensive cultivation of existing acres, there will inevitably be pressure to develop new acres at the expense of wildlife habitat.

This should not be a surprise. Government market policies, assistance programs and tax policies all are geared to extending crop production onto less productive land regardless of other resource interests.

Farmers must use the tools at hand to survive today's economic climate. In many cases, those tools don't take into consideration just how fragile our soil and water resources are.

Beginning in the 1950's, when large, powerful tractors and implements became available, farmers have rapidly converted native cover on marginally productive lands and unused "wasteland" to cropland. Natural plant communities have been reduced to narrow strips around wetlands, along roadsides and rail lines, where predators can systematically destroy nests and young of the year.

Grain production increases over the past few decades have been costly not only to wildlife but to agriculture and Canadian society. They've been achieved at the cost of extensive soil degradation, erosion, salinization, reduced soil productive capability and the need for increased energy and chemical inputs. Off-site environmental damage such as flooding, declining water quality, sedimentation and decreased fish production are often also linked to this production-at-all-cost philosophy.

Conservationists may look to the future with some trepidation but this spectre need not be realized. Soil scientists and agronomists such as Dr. Don Rennie of Saskatchewan, Wayne Lindwall of Alberta and Crawford Jenkins of Manitoba have identified several new technologies that makes it possible to increase grain production on existing arable land without degrading the soil and destroying native cover.

Assisted by government and university extension people, innovative farmers across prairie Canada and the United States are showing this new technology works. Soil and water conservation systems can increase yields significantly by converting much of the 20 to 25 million acres of land summerfallowed annually to continuous cropping. Livestock production can be similarly increased by adopting modern pasture rotation systems which conserve soil and water rather than the traditional range grazing that has resulted in up to 50% of western Canada's pastures being overgrazed.

What is required now is a basic change in attitude by professional agronomists, the general public and agribusiness so a conservation ethic can be rationally melded with sound agricultural production goals.

Agricultural Extension

Ducks Unlimited Canada is working with agricultural agencies to encourage conservation-minded farming practices in the prairie provinces. In 1978, an analysis of agricultural/wildlife inter-relationships under

conventional and modern farming methods was undertaken to identify farming methods that provided soil and water conservation, profitability and habitat benefits.

In 1979, a public relations program based on these data was initiated. DU approached agriculture leaders in the three prairie provinces for assistance in editorial inputs and help in distributing a series of brochures dealing with farming concerns such as salinity, water control and crop depredation and describing conservation compatible techniques such as zero-tillage, rotational grazing and stubble mulching.

The organization launched its agricultural extension field program in 1983 by working with agricultural agencies and innovative farmers to demonstrate soil conserving farming techniques like undercutter cultivation of summerfallow land, rotational grazing and zero-tilled winter wheat.

Winter Wheat

Several species of ducks nest readily in stubble from the previous year's crops but most nests are destroyed during seed bed preparation. Studies show, however, that with zero-tillage seeding (seeding directly into stubble without cultivation), duck production can be increased significantly. At the same time, the dispersal of nests throughout the farm and the buffering effect of abundant alternate prey can effectively reduce predation.

Zero-till seeding of winter wheat or fall rye offers added advantages to duck production. Advanced spring growth of these crops provides better nest concealment; because field operations during the nesting season are reduced or eliminated, nest success rates increase; and the early-maturing fall seeded crops are harvested in early to mid-August, often eliminating waterfowl crop depredation threats.

To encourage greater adoption of zero-till winter wheat DU has helped fund the University of Manitoba Plant Sciences Department's zero-tillage and winter wheat production research.

Stubble Mulched Summerfallow

Twenty to 25 million acres of cropland are fallowed annually in the prairie provinces, much of it in duck breeding areas. When farmers cultivate these lands to control weeds and conserve moisture beginning in late May or June, they incorporate the stubble and destroy its value as nesting cover for waterfowl and upland birds.

In 1981, Ducks Unlimited purchased an undercutting cultivator (stubble mulcher) and loaned it to the Turtle Mountain Conservation District. The TMCD organized a series of demonstrations on Boissevain-area farms to show how the technique provides weed, moisture and erosion control while retaining habitat on summerfallow fields.

Herbicides are used in fall of the harvest year and spring of the fallow year. The first stubble mulching is delayed until the end of June or July, after some of the duck nests have hatched. The machine retains 80% or more of the stubble on the surface to serve as erosion protection and nesting cover. The sweeps produce only a slight ripple on the soil surface and have minimal effect on waterfowl nests. The undercutter demonstrations moved to the Minnedosa area in 1983 where Agricultural Representative Bob Bradley organized a series of three field days attracting about 200 local farmers. This program will be continued in Manitoba in 1984 to measure the effects of undercutter cultivation in terms of erosion control, water retention and crop yields. It will also be extended into the Coteau area of southern Saskatchewan, possibly with the cooperation of Saskatchewan Agriculture's representative at Outlook.

Rotation Grazing

Rotational grazing is a system of managing cattle that maintains native pasture and soils while providing improved duck nesting cover and brood habitat. Pastures are cross-fenced into several smaller paddocks and cattle are moved from one to another in an organized manner throughout the grazing season.

By restricting grazing to specific areas while others rejuvenate, overgrazing of desired plants is eliminated. Plants in the "rested" paddocks are able to build up root reserves and top growth. The taller, denser cover produced provides good nesting habitat. Duck nesting may proceed on some paddocks past the peak hatch period before cattle are moved onto them. The destructive effects of grazing pond shoreline are also reduced thus improving brood cover quality.

In 1983, Ducks Unlimited assisted and helped fund a demonstration program near Pine Lake, Alberta under the direction of Ted Darling, District Agriculturist at Innisfail, on a 160-acre parkland pasture containing well distributed permanent wetlands.

The area was fenced into six paddocks, two of which were in tame forages and responded well to fertilizer. The remaining four were native grasses which had been under heavy grazing and drought pressure.

The rotational system supported 60 cattle over the grazing season on five paddocks, a considerable increase over previous "open range" management. In fact, the rancher was also able to take off some tame hay in August. One native paddock, some 40 acres in area, produced heavy growth but was not needed to carry the herd and provides potential for herd expansion while increasing the ranchers land base.

Because of the extra cover produced and retained during the nesting season, significant increases in production are expected.

The Alberta program will be carried on for at least three years. An additional area will be added and another in Manitoba or Saskatchewan in 1984.

Conclusion

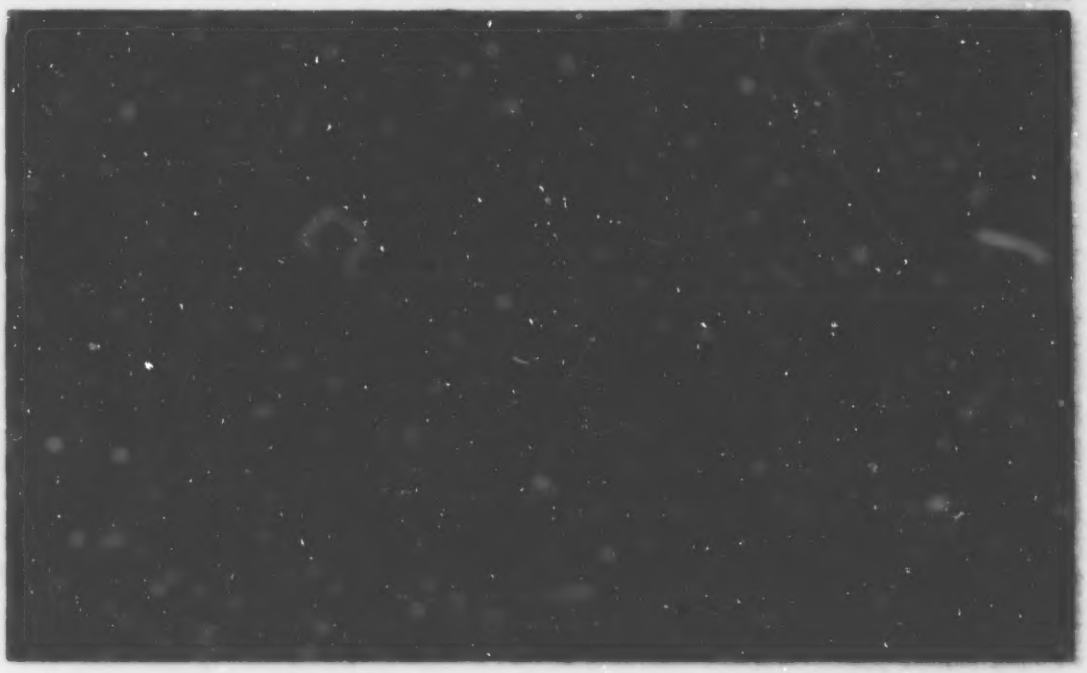
Ducks Unlimited's fledgling agricultural extension program is based on the premise good habitat management can co-exist with conservation-minded farming practices and policies. It requires support and cooperation between natural resource agencies, educational institutes, private interest groups and most important, landowners.

So far, results have been very encouraging. Commitments from both farming and wildlife interests to replace confrontation with co-operation in developing compatible land use policies will ensure our many resources, both agricultural and wildlife, are maintained for the benefit and enjoyment of future generations.

Wayne Cowan
Agricultural Advisor

As part of its program to encourage farming practices more compatible with wildlife habitat conservation, Ducks Unlimited Canada assisted in funding major University of Manitoba Department of Plant Science studies on zero-tilled winter wheat, some of which were carried out at the University's field station at Minto, Manitoba.

Zero-tillage enables farmers to retain nesting cover and reduces nest-destroying field operations; winter wheat is harvested before the fall migration and thus reduces depredation threats.



Tillage demonstrations utilizing a Ducks Unlimited-supplied undercutter or "stubble mulcher" attracted several hundred farmers to Manitoba Department of Agriculture-sponsored field days in the Minnedosa area. Stubble mulching provides farmers with a summerfallow cultivation alternative far less destructive to wildlife than conventional "black earth" tillage usually carried out to control weeds.

DU Canada farm practices demonstration areas are identified with distinctive signs summarizing the agricultural and wildlife benefits of the particular technique being encouraged and acknowledging the cooperation of other agencies. Suitable tracts are identified by local agricultural representatives; landowners make land areas available free of charge.

By encouraging rotational grazing in pastures surrounding wetlands, wildlife managers can improve nesting cover quality and reduce shore-line vegetation damage. Cattlemen benefit from the increased carrying capacity of their land.

The technique involves cross-fencing native and tame pastures and rotating the herd to a rested paddock periodically. Wildlife enjoys more secure habitat in these paddocks where the forage plants are being rested than when the entire pasture is overgrazed.

Brochures outlining the various conservation-compatible farming techniques available to farmers were produced by Ducks Unlimited Canada and are being distributed by local DU representatives and agricultural extension agencies throughout the Prairies. Several editions are now in their third printings.

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